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Route to:

PATENTS

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced at 1039 O.G. 142 on Feb. 21, 1984.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Prior corresponding U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Jan. 30, 1984.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,171,386, Re. S.N. 573,981, Filed Jan. 26, 1984, Cl. 426/658, ANIMAL FEED BLOCK CONTAINING FERROUS SULFATE AND MAGNESIUM OXIDE, Leroy V. Skoch, et al., Owner of Record: *Ralston Purina Co., St. Louis, Mo.,* Attorney or Agent: Virgil B. Hill, Ex. Gp.: 172

4,276,601, Re. S.N. 509,769, Filed June 30, 1983, Cl. 364/431, ELECTRONIC ENGINE CONTROL APPARATUS, Hiroastu Tokuda, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Gregory E. Montone, Ex. Gp.: 237

4,277,829, Re. S.N. 511,590, Filed July 7, 1983, Cl. 364/431, ERROR PREVENTING DEVICE FOR AN ELECTRIC ENGINE CONTROL APPARATUS, Hiroastu Tokuda, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 236

4,287,218, Re. S.N. 528,021, Filed Aug. 31, 1983, Cl. 426/272, READY-TO-EAT MOLDED MEAT PRODUCT, Norman I. Rich, et al., Owner of Record: *Oscar Mayer Foods Corp., Madison, Wis.,* Attorney or Agent: Daniel J. Donovan, et al., Ex. Gp.: 172

4,313,912, Re. S.N. 574,802, Filed Jan. 30, 1984, Cl. 422/267, APPARATUS FOR THE CONTINUOUS EXTRACTION OF OILS AND SOLUBLE SUBSTANCES FROM SOLID MATERIALS, William M. Barger, Owner of Record: *French Oil Machinery Co., Piqua, Ohio,* Attorney or Agent: Nathaniel R. French, Ex. Gp.: 177

4,367,142, Re. S.N. 573,306, Filed Jan. 23, 1984, Cl. 210/163, GRATE FOR DRAINAGE DUCTS, Peter Blecher, Owner of Record: *TWB-Pressteile GmbH, Hagen, Germany,* Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 176

4,382,301, Re. S.N. 575,296, Filed Jan. 30, 1984, Cl. 2/22, SNAKE PROOF CHAPS, George H. Hightower, Jr., Owner of Record: *Thomaston Mills, Inc., Thomaston, Ga.,* Attorney or Agent: Harold L. Stowell, et al., Ex. Gp.: 353

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,919,354, Reexam. No. 90/000,524, Requested: Mar. 5, 1984, Cl. 525/257, IMPACT RESISTANT POLYMERS OF A RESINOUS COPOLYMER OF AN ALKENYL AROMATIC MONOMER AND UNSATURATED DICARBOXYLIC ANHYDRIDE, Eugene R. Moore, et al., Owner of Record: *Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Richard G. Waterman, Ex. Gp.: 142, Requester: Dow Chemical Co., Midland, Mich.

4,358,535, Reexam. No. 90/000,526, Requested: Mar. 12, 1984, Cl. 435/5, SPECIFIC DNA PROBES IN DIAGNOSTIC MICROBIOLOGY, Stanley Falkow, et al., Owner of Record: *Board of Regents of the University of Washington, Seattle, Wash.,* Attorney or Agent: Bertram I. Rowland, Ex. Gp.: 174, Requester: Cetus Corp., Emeryville, Calif.

Errata

"All reference to Patent No. 4,434,055 to Charles B. Nicholson of N.Y. for 'TWO PIECE SCREEN FILTER' appearing in the Official Gazette of Feb. 28, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,435,335 to James M. Mayer of Mo. for 'SUBSTITUTED-BUTANEDIPEROXOIC ACIDS AND PROCESS FOR BLEACHING' appearing in the Official Gazette of Mar. 6, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,435,515 to Oliver J. Zandona, et al. of Ky. for 'CATALYST FOR THE CONVERSION OF CARBO-METALLIC CONTAINING OILS' appearing in the Official Gazette of Mar. 6, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,436,263 to Louis B. Gratzer, et al. of Wash. for 'AERODYNAMICAL-

LY CONTOURED, LOW DRAG WING, ENGINE AND ENGINE NACELLE COMBINATION' appearing in the Official Gazette of Mar. 13, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,437,185 to Yoichiro Sako, et al. of Japan for 'METHOD OF ERROR CORRECTION' appearing in the Official Gazette of Mar. 13, 1984 should be deleted since no patent was granted."

Genetics Engineering and Robotics Search Files Established

The Patent and Trademark Office has established special art collections covering Genetic Engineering and Robotics. These files are maintained in the Scientific Library of the Patent and Trademark Office located on the floor immediately above the Public Search Room for Patents. Both files are available for searching by the public Monday through Friday between the hours of 8:45 a.m. and 4:45 p.m. Both files contain a comprehensive collection of U.S. and foreign patents. The Robotics file also contains a limited collection of non-patent literature. The classification schedule and definitions for Robotics are contained in "Classification Order No. 926" and may be purchased for $3.90. The classification schedule and definitions for Genetic Engineering are contained in "Classification Order No. 927" and may be purchased for $2.90. Requests to purchase these Classification Orders should be sent to :

Documentation Practice and Systems Division
U.S. Patent and Trademark Office
Washington, D.C. 20231

WILLIAM S. LAWSON
Administrator for Documentation.

Mar. 5, 1984

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

American Golfer, Inc., assignee of Straus, Royer & Strass, Inc., Baltimore, Md., Reg. No. 528,315, for the mark "TOM BOY", Canc. No. 13,491.

Power Plus Electronics, Inc., Hollywood, Calif., Reg. No. 1,080,243, for the mark "POWER PLUS", Canc. No. 13,722.

Maxine Anderson, assignee of the Du-Dad Lure Co., Dorchester, Wis., Reg. No. 947,545, for the mark "DAD", Canc. No. 13,784.

Xtravision Corp. of America, New York, N.Y., Reg. No. 1,146,491, for the mark "XTRAVISION", Canc. No. 13,865.

Rodalen, Inc., Clearwater, Fla., Reg. No. 1,161,416, for the mark "CALVIN MAGOO'S HAMBURGERS" and design, Canc. No. 13,882.

Emanuelle Industries, Inc., New York, N.Y., Reg. No. 1,090,382, for the mark "EMANUELLE", Canc. No. 13,888.

Victor Tabaco, Inc., Miami, Fla., Reg. No. 1,056,705, for the mark "NICA", Canc. No. 13,909.

Merrill Co. Publishers, Chicago, Ill., Reg. No. 786,440, for the mark "MERRILL COMPANY" and design, Canc. No. 13,921.

Pronto Oil Corp., Nashville, Tenn., Reg. No. 1,088,890, for the mark "PRONTO" and design, Canc. No. 13,929.

Martens Chemical Corp., Middle Village, N.Y., Reg. No. 860,802, for the mark "FLUF-DRI", Canc. No. 13,935.

The Eleventh Hour, Inc., Chattanooga, Tenn., Reg. No. 893,937, for the mark "THE ELEVENTH HOUR", Canc. No. 13,955.

Cambridge Casuals, Inc. (A New York Corp.), New York, N.Y., Reg. No. 775,431, for the mark "JOVI", Canc. No. 13,959.

United Coconut Corp., New York, N.Y., Reg. No. 839,209, for the mark "UNICO BRAND" and design, Canc. No. 13,965.

Regency Cosmetics, Inc., New City, N.Y., Reg. No. 1,154,392, for the mark "CRYSTALIC", Canc. No. 13,968.

Biscayne Manufacturing Corp., Miami, Fla., Reg. No. 890,365, for the mark "BODYGUARD", Canc. No. 13,977.

Cortez Enterprises, Inc., assignee by merger, change of name and mesne assignment of Clark Equipment Co., Kent, Ohio, Reg. No. 778,427, for the mark "CORTEZ", Canc. No. 13,986.

Jeremy Sportswear, Inc., Beaverton, Oreg., Reg. No. 1,139,255, for the mark "JEREMY SPORTSWEAR", Canc. No. 13,987.

National Newsstand Publications, Inc., New York, N.Y., Reg. No. 1,125,256, for the mark "ROCK", Canc. No. 13,988.

Big Four Automotive Equipment Corp., assignee of Studebaker Corp., South Bend, Ind., Reg. No. 872,940, for the mark "BIG FOUR", Canc. No. 14,002.

Eastern Boneless Beef Co., Philadelphia, Pa., Reg. No. 823,015, for the mark "NATURE'S DELIGHT BRAND", Canc. No. 14,003.

Haas-Davis Packing Co., Inc., Mobile, Ala., Reg. No. 792,338, for the mark "SATSUMA", Canc. No. 14,040.

Chimi's, Inc., Scottsdale, Ariz., Reg. No. 1,105,341, for the mark "CHIMI'S (STYLIZED)", Canc. No. 14,048.

Amco of Norvelt, Inc., New York, N.Y., Reg. No. 796,457, for the mark "WEATHER-OR-NOTS", Canc. No. 14,077.

Tarco, Inc., by change of name from the Tarrson Co., Chicago, Ill., Reg. No. 1,106,735, for the mark "PRESTOFIX CREATIVE SYSTEMS", Canc. No. 14,082.

Nichols Alley Co., Inc., Columbus, Ga., Reg. No. 1,155,135, for the mark "NICHOLS' ALLEY" and design, Canc. No. 14,089.

Sammy Tanner Distributing Co., Inc., Wilmington, Calif., Reg. No. 853,229, for the mark "ASCOT", Canc. No. 14,092.

ERMA S. BROWN,
Deputy Clerk, Trademark Trial and Appeal Board.

For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Listing of Bonded Draftsman

The following listing of bonded draftsman supersedes the listing published on Apr. 6, 1982, at 1017 O.G. 4:

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26 N St., S.E.
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P.O. Box 2404
556 S. 22nd St.
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(703) 892-2612

Quinn Patent Drawing Service Co.
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Mar. 7, 1984.

THERESA A. BRELSFORD
Assistant Commissioner
for Administration.

Patent Suits
Notices under 35 U.S.C. 290; Patent Act of 1952

3,206,722, Gustus and Potenza, TRAFFIC CONTROL SYSTEM FOR DRIVE-IN BANKS AND THE LIKE; **3,588,808,** Rolfe T. Gustus, IMPROVED TRAFFIC CONTROL SYSTEM FOR DRIVE-IN BANKS AND THE LIKE; **3,886,414,** Lach and Brier, DISPATCHING SYSTEM CIRCUIT; **3,893,097,** Lach and Brier, DISPATCHING SYSTEM CIRCUIT; **4,010,404,** Ronald Louis Lach, TRAFFIC ERROR CORRECTING CIRCUIT FOR TRAFFIC DISPATCHING SYSTEM, **filed** Sept. 27, 1979, D.C., N.D. Ill. (Chicago), Doc. 79 C 4056, *Elec-Tro-Tec, Inc.* v. *Actron, Inc., et al.* Cause dismissed without prejudice and on July 8, 1980 cause will be dismissed with prejudice. Filed June 17, 1980.

3,353,170, Cerberus AG, IONIZATION FIRE ALARM SYSTEM; **3,521,263, same,** IONIZATION FIRE ALARM AND IMPROVED METHOD OF DETECTING SMOKE AND COMBUSTION AEROSOLS; **4,074,341, same,** INTERLOCKED SEPARABLE FIRE SENSOR CONSTRUCTION, **filed** Aug. 12, 1982, D.C., S.D.N.Y., Doc. 82-Civ-5347 (GLG), *Baker Industries, Inc.* v. *Cerberus Ltd.*

3,521,263. (See 3,353,170.)

3,588,808. (See 3,206,722.)

3,615,087, Inventec Intl., Ltd., WORKBENCHES; **4,076,229, same, filed** Jan. 14, 1980, D.C. W.D.N.C. (Asheville), Doc. B-C-80-7, *The Black & Decker Mfg. Co. and Inventec Intl., Ltd.* v. *Emerson Electric Co.* Defendant is enjoined and restrained from further infringing Plaintiff's patent. Filed Aug. 31, 1982.

3,628,849, Flamand, Labeyrie and Pieuchard, DIFFRACTION GRATINGS; **3,909,134,** Pieuchard, Flamand and Cordelle, MONOCHROMATOR WITH A CONCAVE GRATING; **3,930,728,** Pieuchard, Flamand and Passereau, MONOCHROMATOR WITH CONCAVE GRATING; **4,063,818,** Didier Lepere, MONOCHROMATOR HAVING A TOROIDAL HOLOGRAPHIC DIFFRACTION GRATING AND UTILIZABLE IN THE ULTRAVIOLET BAND; **4,087,183,** Genevieve Passereau, SPECTROGRAPH; **4,191,474,** Genevieve Passereau, SPECTROGRAPH FOR AN EXTENDED SPECTRAL FIELD IN WHICH PARTIAL PLANAR DIFFRACTION SPECTRA ARE SUCCESSIVELY FORMED IN THE SAME PLANE, **filed** Mar. 6, 1981, D.C. Del. (Wilmington), Doc. 81-92, *Instruments SA, Inc.* v. *American Holographic, Inc.*

3,648,768, Gunter Scholl, HEAT-EXCHANGER COMPONENTS; **4,112,921,** Calvin Dodd MacCracken, METHOD AND SYSTEM FOR UTILIZING A FLEXIBLE TUBING SOLAR COLLECTOR; **4,176,654,** Zinn and Krulick, SOLAR HEATING APPARATUS; **4,270,596,** Zinn, Krulick and Leonard,

TUBE MAT HEAT EXCHANGER, **filed** Feb. 23, 1982, D.C., S.D.N.Y., Doc. 82-Civ-1090, *Delford Industries, Inc.* v. *Bio-Energy Systems, Inc.*

3,659,294, Otto Bock Orthopadische Industries, KG, ADJUSTABLE LINK FOR FROSTHETIC LIMB; **4,007,496, same,** CONNECTION BETWEEN A COSMETIC COVER AND A PROSTHETIC PART, **filed** Aug. 9, 1982, D.C. Minn. (St. Paul), Doc. CV-3-82-1086, *Otto Bock Orthopadische Industries KG, et al.* v. *Daw Industries, Inc., et al.*

3,702,886 Mobil Oil Corp., CRYSTALLINE ZEOLITE ZSM-5 AND METHOD OF PREPARING THE SAME; **4,049,573, same,** ZEOLITE CATALYST CONTAINING OXIDE OF BORON OR MAGNESIUM, **filed** Apr. 15, 1983, D.C. Del. (Wilmington), Doc. 83-207, *Mobil Oil Corp.* v. *Amoco Chemicals Corp.*

3,886,414. (See 3,206,722.)

3,874,205, Hurco Mfg. Co., Inc., DIGITALLY CONTROLLED MULTIPLE DEPTH STOP AND RETURN STROKE LIMIT CONTROL FOR PRESS BRAKES; **4,074,350, same,** SOFT-WIRED MACHINE TOOL CONTROL, **filed** Dec. 14, 1982, D.C. Mass. (Boston), Doc. 82-3803-C, *Hurco Mfg. Co., Inc.* v. *Dynamics Research Corp.*

3,893,097. (See 3,206,722.)

3,909,134. (See 3,628,849.)

3,930,728. (See 3,628,849.)

3,942,544, Spiral Step Tool Co., HOPPER PAYOUT FOR VARIOUS COIN DENOMINATIONS; **4,036,242, same, filed** Apr. 26, 1983, D.C. Nev. (Reno), Doc. CV-R-83-126, *Spiral Step Tool Co.* v. *Summit Systems, Inc., et al.*

4,007,496. (See 3,659,294.)

4,008,458, Gerald J. Wensley, REMOTE AUTOMATIC READING SYSTEM, **filed** May 19, 1983, D.C. Neb. (Omaha), Doc. CV83-0-344, *George Risk, et al.* v. *Gerald J. Wensley.* Dismissal of Action filed Sept. 29, 1983.

4,009,063, Insituform (Pipes & Structures) Ltd., METHOD OF LINING A PIPE; **4,064,211, same,** LINING OF PASSAGEWAYS, **filed** May 20, 1981, D.C., E.D. Mich. (Flint), Doc. 81-40110, *Insituform of Mich.* v. *Insituform (Pipes & Structures) Ltd., et al.*

4,010,404. (See 3,206,722.)

4,010,824, Edward F. Bavis, CONVEYOR SYSTEM FOR DRIVE-IN BANKS AND THE LIKE, **filed** Feb. 11, 1983, D.C., N.D. Iowa (Cedar Rapids), Doc. 83-0022, *Kidde, Inc.* v. *E. F. Bavis Associates, Inc. and Edward F. Bavis.* Action dismissed per Judgment filed Oct. 25, 1983.

4,010,976, William D. Shields, MOTORCYCLE FAIRING, **filed** Jan. 29, 1980, D.C., N.D. Ill. (Chicago), Doc. 80 C 0486, *Product Design Corp.* v. *National Cycle, Inc.* Plaintiff's complaint and Defendants counterclaim are dismissed with prejudice per Judgment Order dated Dec. 13, 1983.

4,011,962, Donald G. Favell, TWO PIECE CLOSURE FOR CONTAINERS, **filed** June 27, 1980, D.C. Del. (Wilmington), Doc. 80-316, *Ethyl Products Co.* v. *Risdon Corp.* Rule 41 Dismissal without prejudice dated Feb. 2, 1981.

4,013,864, Tiegel Mfg. Co., APPARATUS FOR FABRICATING THROUGH-THE-WALL BATTERY CONNECTORS, **filed** July 9, 1981, D.C., M.D. Fla. (Tampa), Doc. 81-633 Civ T K, *Tiegel Mfg Co.* v. *Farmer Mold & Machine Works, Inc.*

4,013,965, James A. Scharfe, Jr., CIRCUIT FOR PREVENTING ERRORS IN DECODING INFORMATION FROM DISTORTED PULSES; **4,229,698, same,** TUNING INDICATOR, **filed** Sept. 20, 1983, D.C., S.D. Calif. (San Diego), Doc. 83-1761-K (H), *James A. Scharfe, Jr.* v. *Trans World Electronics, Inc.*

4,015,706, Chemcut Corp., CONNECTING MODULES FOR AN ETCHING SYSTEM, **filed** June 25, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 3201, *Chemcut Corp.* v. *Gebr. Schmid Maschinenfabrik GmbH & Co., et al.*

4,016,977, The Cooperative Marketing Co., ASSEMBLAGE WITH DUAL SUPPORT, **filed** Jan. 19, 1983, D.C., S.D.N.Y., Doc. 83-Civ-0574, *The Cooperative Marketing Co.* v. *Sandy Alexander Alexander, Inc.*

4,017,970, Ann Williams, TILE AND TUB SCRAPER, **filed** Aug. 23, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 5833, *Ann Williams, et al.* v. *The Gillette Co.* Case dismissed for failure to state a cause of action on Oct. 12, 1983.

4,021,092, Ericson Mfg. Co., ELECTRICAL CONNECTOR, **filed** Mar. 26, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 1876, *Daniel Woodhead* v. *Ericson Mfg. Co.*

4,022,009, Akzo N.V., METALLIC CABLE; **4,030,248, same,** METHOD AND APPARATUS FOR MAKING FILAMENT CABLES, **filed** Apr. 23, 1982, D.C. District of Columbia (Wash. D.C.), Doc. 82-1122, *Bekaert Steel Wire Corp.* v. *Akzo N.V.* Notice of voluntary dismissal of action without prejudice filed by plaintiff on Nov. 9, 1982.

4,027,431, National Gypsum Co., SINGLE HUNG WINDOW WITH REMOVABLE FIXED LITE, **filed** Aug. 16, 1983, D.C., M.D. Tenn. (Nashville), Doc. 3-83-0648, *National Gypsum Co.* v. *Gallatin Aluminum Products Co., Inc.*

4,027,613, Donald L. Wollard, PLANING BOAT HULL, **filed** Sept. 26, 1983, D.C., E.D.N.C. (New Bern), Doc. 83-134-CIV-4, *Donald L. Wollard* v. *Fountain Powerboats, Inc., et al.*

4,030,248. (See 4,022,009.)

4,030,939, Southwest Research Institute, CEMENT COMPOSITION, **filed** Nov. 14, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-6708, *Southwest Research Institute, et al.* v. *M. O. Fulton, Inc., et al.*

4,036,242, Spiral Step Tool Co., HOPPER PAYOUT FOR VARIOUS COIN DENOMINATIONS, **filed** Apr. 29, 1983, D.C.N.J. (Camden), Doc. 83-1543, *Spiral Step Tool Co.* v. *International Game Technology.* Stipulation of Dismissal without prejudice and costs filed Feb. 1, 1984.

4,036,242. (See 3,942,544.)

4,037,337, Charles Wayne Hemphill, EXCAVATING BUCKET AND TEETH FOR A BACKHOE; **4,117,611, same,** DIGGING TEETH FOR AN EXCAVATING BUCKET; **4,123,861, same,** METHOD OF EXCAVATING EARTH WITH A BUCKET, **filed** May 1, 1981, D.C., N.D. Tex. (Dallas), Doc. CA3-81-0713-D, *GH Hensley Industries, Inc.* v. *Kirkpatrick & O'Donnell Construction Equipment Co.*

4,037,418, Phillips Stamping Co., Inc. LOAD SUPPORTING BEARING PLATE, **filed** May 11, 1978, D.C., W.D. Pa. (Pittsburgh), Doc. 78-523, *Jennmar Corp.* v. *Phillips Stamping Co., Inc.,* Case closed without prejudice per Order dated Jan. 22, 1981.

4,040,098, Convergence Corp., EDITING SYSTEM FOR CONTROLLING THE TRANSFER OF SELECTED VIDEO INFORMATION FROM A VIDEO SOURCE TO A VIDEO TAPE RECORDER, **filed** Mar. 10, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80 00903, *Convergence Corp.* v. *United Media, Inc.* **Same, filed** Mar. 10, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80 00904, *Convergence Corp.* v. *Bell & Howell Co.* **Same, filed** Mar. 10, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80 00905, *Convergence Corp.* v. *Whittaker Corp. (Dynasciences Unit).* **Same, filed** Mar. 13,

1980, D.C., N.D. Calif. (San Francisco), Doc. 80-786 WHO, *Convergence Corp.* v. *Videomedia.* **Same, filed** Mar. 13, 1980, D.C., N.D. Calif. (San Francisco) Doc. C-80-0787-SAW, *Convergence Corp.* v. *Cezar Intl., Inc.* **Same, filed** Mar. 13, 1980, D.C., N.D. Calif. (San Francisco), Doc. C80-788 WWS, *Convergence Corp.* v. *EMS, Inc.* **Same, filed** Mar. 13, 1980, D.C., N.D. Calif. (San Francisco), Doc. C 80-0789 WHO, *Convergence Corp.* v. *Harris Video Systems.* Stipulation and Order dismissing complaint without prejudice dated May 8, 1981.

4,040,303, FMC Corp., TWO MASS VIBRATORY MATERIAL HANDLING APPARATUS AND METHODS OF MANUFACTURING AND FINE TUNING THE SAME; **4,218,929,** William V. Spurlin, VIBRATORY DEVICE FOR FEEDERS AND THE LIKE, **filed** Apr. 18, 1983, D.C., W.D. Pa. (Pittsburgh), Doc. 83-906, *FMC Corp.* v. *William V. Spurlin, et al.*

4,043,449, Mida Mfg. Co., GIFT PACKAGE CONTAINING MESSAGE BEARING UNIT AND USEFUL ARTICLE IN ASSOCIATION THEREWITH, **filed** July 26, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4860 (JES), *Mida Mfg. Co.* v. *S. Axelrod Co., Inc.*

4,044,523, Eberhard Layher, FRAME STRUCTURE, PARTICULARLY SCAFFOLDING; **4,180,342, same,** ARRANGEMENT FOR CONNECTING STRUCTURAL MEMBERS, **filed** Dec. 17, 1982, D.C.N.J. (Newark), Doc. 82-4271, *Patent Scaffolding Co.* v. *Wilhelm Layher, GmbH, et al.*

4,047,197, Semikron, Gesellschraft fur Gleichrichterbau und Electronik m.b.H., HOUSING AND LEAD STRUCTURE FOR A SERIES CONNECTED SEMICONDUCTOR RECTIFIER ARRANGEMENT, **filed** Sept. 23, 1983, D.C., C.D. Calif. (Los Angeles), Doc. CV 83 6152 CHH (Jrx), *Semikron, Gesellschraft fur Gleichrichterbau und Electronik m.b.H.* v. *Silicon Power Cube Corp.*

4,049,573. (See 3,702,886.)

4,049,942, Ateliers des Charmilles, S.A., IMPROVEMENTS IN AND RELATING TO ELECTRIC DISCHARGE MACHINING METHOD AND DEVICE WITH PRESET ELECTRODE FEED; **4,057,703, same,** METHOD OF MACHINING BY EROSIVE ELECTRICAL DISCHARGES, **4,104,500, same,** DEVICE FOR ELECTRICAL DISCHARGE MACHINING WITH SIMULTANEOUS RELATIVE ADVANCE AND CYCLIC TRANSLATIONAL MOVEMENT OF THE ELECTRODES; **4,104,501, same,** METHOD OF ELECTRICAL DISCHARGE MACHINING WITH SIMULTANEOUS RELATIVE ADVANCE AND CYCLIC TRANSLATIONAL MOVEMENT OF THE ELECTRODES, **filed** Mar. 11, 1980, D.C.N.J. (Newark), Doc. 80-656, *Ateliers des Charmilles, S.A.* v. *System 3R USA, Inc.* Order of dismissal of Action filed Jan. 15, 1981.

4,051,683, Jennmar Corp., METHOD AND APPARATUS FOR SUPPORTING A MINE ROOF; **Reg. No. 1,165,222** (COMBINATION), Jennmar Corp., **filed** Oct. 26, 1982, D.C., W.D. Pa. (Pittsburgh), Doc. 82-2254, *Jennmar Corp.* v. *Republic Corp., et al.* Stipulation of Dismissal without prejudice filed Aug. 19, 1983.

4,057,703. (See 4,049,942.)

4,059,215, Lamons Metal Gasket Co., CIRCULAR DOUBLE-JACKETED GASKET WITH SINGLE JOINT, **filed** Mar. 29, 1982, D.C., S.D. Tex. (Houston), Doc. H-82-0885, *Lamons Metal Gasket Co.* v. *Sepco Corp.*

4,063,818. (See 3,628,849.)

4,064,206, Gerhard Seufert, PROCESS FOR FORMING FLEXIBLE FOLD LINES IN THERMOPLASTIC SHEETS; **4,179,252, same,** APPARATUS FOR FORMING FLEXIBLE FOLD LINES IN THERMOPLASTIC SHEETS AND ARTICLE SO FORMED, **filed** Dec. 14, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 9172, *Klearfold, Inc.* v. *Transparent Container Co., Inc.*

4,064,211, Insituform, Ltd., LINING OF PASSAGEWAYS, **filed** June 19, 1981, D.C., W.D.N.Y. (Buffalo), Doc. Civ-81-495B (E), *Insituform of North America, Inc.* v. *Sewer Specialists of Owosso, Inc., et al.*

4,064,211 (See 4,009,063.)

4,065,648, The Astatic Corp., MICROPHONE SCREEN, **filed** Jan. 13, 1984, D.C. Del. (Wilmington), Doc. 84-20, *The Astatic Corp.* v. *Peavey Electronics Corp., et al.*

4,066,847, Automation Electronics Corp., AUTOMATIC CALL ANSWERING AND SEQUENCING SYSTEM, **filed** Oct. 27, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81 5553 WMB, *Automation Electronics Corp.* v. *U.S. United Systems, et al.*

4,068,402, Yutaka Tanaka, TOY VEHICLE AND TRACKWAY; **D. 248,887, same,** TOY TRACKWAY, **filed** Aug. 13, 1979, D.C., S.D.N.Y., Doc. 79-Civ-4231 TPG, *Toybox Corp.* v. *Ilfelder Toy Co., Inc.* U.S. Pat. No. 4,068,402's Claims 1-6 are invalid. U.S. Design No. 248,887 is invalid. Judgment is hereby entered against plaintiff on May 17, 1982.

4,068,433, J. Raymond Glover, WOOD-FRAME GLASS DOOR UNIT, **filed** June 18, 1982, D.C. Minn. (St. Paul), Doc. 6-81-771, *Marvin Lumber and Cedar Co.* v. *Moulding Products, Inc. and J. Raymond Glover.*

4,071,389, Frank E. Ives, CYLINDER-MAKING APPARATUS AND METHOD, **filed** Oct. 29, 1981, D.C., W.D. Okla. (Oklahoma City), Doc. CIV-81-1493, *Frank E. Ives, et al.* v. *Fiberglass Equipment Co., et al.* Judgment filed June 2, 1982.

4,074,341. (See 3,353,170.)

4,074,350. (See 3,874,205.)

4,074,447, Shivers, Jr., Shivers and Shivers, STUMP CUTTING AND PRECISION DIGGING APPARATUS, **filed** July 15, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 4567 LEW (Gx), *Paul N. Shivers, et al.* v. *Arrowhead Continental, Inc., et al.*

4,076,229. (See 3,615,087.)

4,076,698, E. I. du Pont de Nemours & Co., HYDROCARBON INTERPOLYMER COMPOSITIONS, **filed** Nov. 13, 1981, D.C. Del. (Wilmington), Doc. 81-508, *E. I. du Pont de Nemours & Co.* v. *Phillips Petroleum Co.*

4,079,701, Westinghouse Electric Corp., STEAM GENERATOR SLUDGE REMOVAL SYSTEM, **filed** Nov. 18, 1983, D.C. Del. (Wilmington), Doc 83-816, *Westinghouse Electric Corp.* v. *Halliburton Industrial Services, Inc.* Defendant is permanently enjoined from further infringing Pat. No. 4,079,701 per Consent Judgment dated Feb. 2, 1984.

4,081,190, Daniel Itzler, PLUMBING DEVICE, **filed** Dec. 12, 1983, D.C., S.D.N.Y., Doc. 83-Civ-8979 KTD, *Daljack Industries, Inc.* v. *Nokman Menaker.*

4,084,381, Cain, Teague and Wright, STABILIZATION OF EARTH SUBSURFACE LAYERS; **4,233,015,** Teague and Wright, EMPLOYING QUICKLIME IN STABILIZING EARTH, **filed** Apr. 4, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-2922, *Woodbine Corp.* v. *Holland Soil Stabilizers, Inc.*

4,084,539, Copar Corp., VOLTAGE TO AIR PRESSURE TRANSDUCER, **filed** Nov. 14, 1978, D.C., S.D. Ohio (Cincinnati), Doc. C-1-78-726, *Valco Cincinnati, Inc.* v. *Copar Corp.* Stipulation of Dismissal without prejudice filed Sept. 18, 1979.

4,087,124, Rudkin-Wiley Corp., ILLUMINATED DRAG REDUCING SYSTEM, **filed** Oct. 8, 1982, D.C., N.D. Ohio (Cleveland), Doc. 82-2719Y, *Rudkin-Wiley Corp.* v. *Premix, Inc.* Stipulation and Order

dismissing complaint, without prejudice, filed Sept. 15, 1983.

4,087,183. (See 3,628,849.)

4,096,523, Belmares-Sarabia, Chayka and Lund, COLOR CORRECTION SYSTEM, **filed** May 27, 1981, D.C., S.D.N.Y., Doc. 81-Civ-2236, *Corporate Communications Consultants, Inc.* v. *Columbia Pictures Ind., Inc., et al.* **Same, filed** May 27, 1981, D.C.N.J. (Newark), Doc. 81-1608, *Corporate Communications Consultants, Inc.* v. *Dubner Computer Systems, Inc., et al.*

4,096,577, Ferber and Pavelle, THIN FLEXIBLE ELECTRONIC CALCULATOR, **filed** Nov. 15, 1983, D.C., S.D.N.Y., Doc. 83-Civ-8305 CES, *Leon Ferber and Richard Pavelle* v. *American Express Co.*

4,103,736, Anchor Hocking Corp., APPARATUS FOR HEATING A FOOD ITEM WHILE RETAINING ITS MOISTURE AND NUTRITIONAL COMPONENTS; **4,323,110, same,** FOOD PREPARATION PROCESS, **filed** Jan. 9, 1984, D.C. Del. (Wilmington), Doc. 84-11, *Anchor Hocking Corp.* v. *Aladdin Synergistics, Inc.*

4,104,500. (See 4,049,942.)

4,104,501. (See 4,049,942.)

4,109,343, C. L. Frost & Son, Inc., TROLLEY WHEEL ASSEMBLY, **filed** Aug. 22, 1983, D.C., N.D. Ga. (Atlanta), Doc. C83-1752A, *C.L. Frost & Son, Inc.* v. *Tri-II, Inc.* Defendant is perpetually enjoined from further infringing Plaintiff's patent. Consent Judgment and Decree filed Jan. 24, 1984.

4,112,921, Calvin Dodd MacCracken, METHOD AND SYSTEM FOR UTILIZING A FLEXIBLE TUBING SOLAR COLLECTOR; **4,270,596,** Zinn, Krulick and Leonard, TUBE MAT HEAT EXCHANGER, **filed** Mar. 5, 1982, D.C., S.D.N.Y., Doc. 82-Civ-1377, *Bio-Energy Systems, Inc.* v. *Insolar, Inc.*

4,112,921. (See 3,648,768.)

4,117,195, Etablissements Maillefer S.A., MANUFACTURE OF EXTRUDED PRODUCTS, **filed** Feb. 13, 1981, D.C.N.J. (Newark), Doc. 81-0459, *Etablissements Maillefer S.A.* v. *John Royle & Sons.* Order dismissing action without costs filed Mar. 22, 1983.

4,117,611. (See 4,037,337.)

4,123,861. (see 4,037,337.)

4,166,036, Environmental Elements Corp., FLOATING SKIMMING APPARATUS, **filed** July 13, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 4811, *Environmental Elements Corp.* v. *Lakeside Equipment Corp.*

4,176,654. (See 3,648,768.)

4,179,252. (See 4,064,206.)

4,180,342. (See 4,044,523.)

4,182,586, Precision Metal Fabricators, Inc., AIR OPERATED CONVEYOR APPARATUS, **filed** Jan. 27, 1984, D.C. Wyoming (Cheyenne), Doc. C84-0040, *Precision Metal Fabricators, Inc.* v. *Crown Cork & Seal Co., Inc.*

4,188,825, James G. Farrar, MONITOR FOR DIVERS TO AVOID DECOMPRESSION, **filed** Jan. 18, 1984, D.C., N.D. Calif. (San Francisco), Doc. C84 0230 JPV, *Tekna* v. *Aquatechnology, Inc.*

4,191,474. (See 3,628,849.)

4,218,929. (See 4,040,303.)

4,229,698. (See 4,013,965.)

4,233,015. (See 4,084,381.)

4,250,787, Segan and Swarztrauber, MUSIC TONE GENERATOR, **filed** Feb. 17, 1981, D.C.N.J. (Newark), Doc. 81-477, *Calfax, Inc.* v. *Guilden Development Co., Inc.* Order terminating action administratively filed Sept. 16, 1981.

4,270,596. (See 3,648,768 and 4,112,921.)

4,295,532, Acra-Plant, Inc., PLANTER WITH COOPERATING TRASH CLEARING DISCS, **filed** Jan. 11, 1984, D.C. Neb. (Lincoln), Doc. CV84-L-26, *Acra-Plant, Inc.* v. *Orthman Mfg., Inc.*

4,302,043, Wahpeton Canvas Co., Inc., ROLL-UP TARP FOR TRAILERS, **filed** Apr. 20, 1982, D.C. N. Dak. (Fargo), Doc. A3-82-61, *Wahpeton Canvas Co., Inc.* v. *Frontier, Inc. et al.*

4,323,110. (See 4,103,736.)

4,325,152, Michael Carpenter, FLOTATION MATTRESS, **filed** Jan. 10, 1984, D.C. Md. (Baltimore), Doc. N-84-83, *Michael Carpenter* v. *U.S. Watermattress Corp.*

4,346,442, Merrill, Lynch, Pierce, Fenner & Smith, Inc., SECURITIES BROKERAGE-CASH MANAGEMENT SYSTEM, **filed** Oct. 19, 1982, D.C. Del. (Wilmington), Doc. 82-680, *Paine, Webber, Jackson & Curtis, Inc.* v. *Merrill, Lynch, Pierce, Fenner & Smith, Inc.*

4,363,959, E. R. Wagner Mfg. Co., STAND-OFF FOR RESISTANCE WIRES, **filed** Jan. 18, 1984, D.C., E.D. Mo. (St. Louis), Doc. 84-0168C(A), *Intertherm, Inc.* v. *E. R. Wagner Mfg. Co.*

4,378,953, Advanced Semiconductor Products, THIN, OPTICAL MEMBRANES AND METHODS AND APPARATUS FOR MAKING THEM, **filed** Apr. 25, 1983, D.C., S.D.N.Y., Doc. 83-Civ-3148, *Tau Laboratories, Inc.* v. *Advanced Semiconductor Products.* **Same, filed** May 26, 1983, D.C., N.D. Calif. (San Jose), Doc. C-83-20033 WAI, *Advanced Semiconductor Products, Inc.* v. *Micro Lithography, Inc.*

4,387,072, J. M. Ney Co., NOVEL PALLADIUM ALLOY AND DENTAL RESTORATIONS UTILIZING SAME, **filed** June 8, 1983, D.C. Conn. (Hartford), Doc. H-83-486, *J. M. Ney Co.* v. *Jeneric Industries, Inc.*

4,387,297, Symbol Technologies, Inc., PORTABLE LASER SCANNING SYSTEM AND SCANNING METHODS; **4,409,470, same,** NARROW-BODIED SINGLE-AND-TWIN-WINDOWED PORTABLE LASER SCANNING HEAD FOR READING BAR CODE SYMBOLS, **filed** Jan. 27, 1984, D.C., N.D. Calif. (San Jose), Doc. C 84 20051 RPA, *Symbol Technologies, Inc.* v. *Spectra-Physics, Inc.*

4,404,687, Markus Hager, CONVERTIBLE OUTERWEAR AND CARRYING BAG **filed** Nov. 14, 1983, D.C., S.D.N.Y., Doc. 83-Civ-8247, *Franconia Sportswear, Inc. and Markus Hager* v. *Anchas America Ltd., et al.* Plaintiff's U.S. Pat. No. 4,404,687 is valid and has been infringed by defendants. Defendants are permanently enjoined from making, importing, etc. any garment which infringes the aforesaid patent, per Final Judgment on Consent filed Jan. 20, 1984.

4,406,015, Toshiyuki Koga, FLUORESCENT X-RAY FILM THICKNESS GAUGE, **filed** Dec. 30, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 8507, *Seiko Denshi Kogyo Kabushiki Kaisha* v. *UPA Technology, Inc.*

4,409,470. (See 4,387,297.)

D. 248,887. (See 4,068,402.)

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1, 2, and 10
Docket No. 40308-24
Practice Before the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce
Action: Advance Notice of Proposed Rulemaking

Summary: In Aug. 1983, the Patent and Trademark Office (PTO) proposed amendments to the rules governing standards of conduct and disciplinary proceedings for attorneys and agents who practice before the PTO. Two hearings were held. After reviewing written comments and oral presentations at the hearings, the PTO has decided to withdraw, and not adopt, the rules as then proposed. This advance notice of proposed rulemaking sets forth changes that the PTO is considering in the rules governing admission to practice before the PTO, standards of conduct for those representing applicants and others before the PTO, and conduct of disciplinary proceedings. Interested individuals are invited to comment on the proposed rules being considered. A formal notice of proposed rulemaking could be published as early as July 31, 1984. A hearing on any formal proposal could be held in Oct., 1984.

Date: Comments should be received on or before July 9, 1984.

Address: Address written comments to Box 8, Commissioner of Patents and Trademarks, Washington, D. C. 20231 marked to the attention of Fred E. McKelvey (703) 557-4025 (if no answer, message may be left at 703-557-4103).

For Further Information Contact: Fred E. McKelvey by telephone at (703)-557-4025 (if no answer message may be left at 703-557-4103) or by mail to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: Attorneys and agents practice before the Patent and Trademark Office (PTO) in patent cases. 35 U.S.C. 31. Attorneys also practice before the PTO in trademark and other non-patent cases. 5 U.S.C. 500(b). A limited number of agents also practice before the PTO in trademark cases under rules in force prior to Jan. 1, 1957.

A notice of proposed rulemaking for attorney and agent conduct and disciplinary procedure was published on Aug. 11, 1983 in the Federal Register, 48 F.R. 36478, and on Sept. 20, 1983 in the *Official Gazette*, 1034 O.G. 39, 1034 TMOG 33. A notice extending the comment period and setting a second hearing was published on Oct. 5, 1983 in the Federal Register, 48 F.R. 45424, and on Oct. 18, 1983, in the *Official Gazette*, 1035 O.G. 19, 1035 TMOG 17. The PTO has decided to withdraw, and not adopt, the rules proposed in the Federal Register notice of Aug. 11, 1983. There were numerous objections to the proposed rules and the public indicated that a longer period for study and review of a code of conduct and disciplinary procedures was necessary.

Accordingly, the PTO is issuing this advance notice of proposed rulemaking to permit interested individuals sufficient time to study and review the rules being considered. After written comments are received in response to this advance notice, a notice of proposed rulemaking will be published. The PTO expects to be able to publish a notice of proposed rulemaking on or about July 31, 1984. The PTO also expects to hold a hearing sometime in Oct. of 1984 and that new rules governing admission to practice, conduct, and disciplinary procedures will be issued before the end of 1984.

This advance notice of proposed rulemaking sets out rules being considered in three areas:

(1) Rules governing practice of attorneys and agents before the PTO in patent, trademark, and other non-patent cases (§§10.2 through 10.19);

(2) Rules setting out a PTO Code of Professional Responsibility (§§10.20 through 10.112); and

(3) Rules governing (a) investigation of possible violations of the PTO Code of Professional Responsibility and (b) disciplinary proceedings to reprimand, suspend, or exclude (disbar) individuals practicing before the PTO who, after notice and opportunity for a hearing, are found to have violated a disciplinary rule of the PTO of Professional Responsibility (§§10.130 through 10.161).

Tables 1, 2, and 3 are included in this advance notice to assist readers in correlating present rules with the proposed rules being considered and to find the principal source for the rules being considered. An indication in Tables 1, 2, or 3 that a section is "new" means that a corresponding section does not currently appear in Title 37 of the Code of Federal Regulations.

Table 1 shows the principal sources of the rules being considered which relate to (1) admission to practice of attorneys and agents in patent cases and (2) practice in trademark and other non-patent cases.

Table 2 shows the principal sources of the rules being considered for the PTO Code of Professional Responsibility.

Table 3 shows the principal sources of the rules being considered for disciplinary proceedings and makes reference to corresponding sections in the notice of proposed rulemaking published in the Federal Register on Aug. 11, 1983.

Other sources for the rules being considered are set forth under the discussion of each rule being considered.

Section 1.8 would be amended to exclude from the application thereof papers filed in disciplinary proceedings under Part 10. Under the rule being considered, papers filed in a disciplinary proceeding would have to actually reach the PTO or an administrative law judge (ALJ) within the time set for filing the paper. A certificate of mailing could not be used. The rule is being considered because other rules being considered would call for the use of an ALJ. The PTO does not employ an ALJ. Accordingly, papers filed with the ALJ would not be filed in the PTO.

Section 1.31 would be amended to refer to Part 10.

Paragraph (a) of §1.34 would be amended to refer to Part 10.

The center heading preceding §1.341 and §§1.341 through 1.348 would be deleted.

Section 2.11 would be amended to refer to Part 10.

Paragraph (a) of §2.17 would be amended to refer to Part 10.

Section 2.19 would be amended by adding paragraph (b) which would require permission for a practitioner to withdraw from representing a party in a trademark case. Application to and approval by the Commissioner would be required. Attorneys representing parties in trademark cases before the Trademark Trial and Appeal Board often move for leave to withdraw. Section 602.03 of the Trademark Manual of Examining Procedure [1st Ed., Rev. 5, Dec., 1982] permits withdrawal in *ex parte* trademark cases, "but such withdrawal should not be done in a manner which would prejudice applicant." It would be expected that requests for withdrawal in *ex parte* trademark cases would be decided by the Director of the Trademark Operation or another appropriate PTO employee and that request for withdrawal in *inter partes* trademark cases would continue to be decided by the Trademark Trial and Appeal Board.

Section 10.1 would set out definitions for terms used in Part 10. Terms which are defined include affidavit, application, attorney, Canon, confidence, differing interests, Director (meaning Director of Enrollment and Discipline), Disciplinary Rule, employee of a tribunal (which would include PTO employees), law firm, lawyer, legal counsel, legal profession, legal service, legal system, non-lawyer, non-practitioner, Office (meaning PTO), person (which would include corporations, associations, trusts, partnerships, and other legal entities), practitioner, proceeding before the Office, professional legal corporation, registration (meaning registration to practice before the PTO in patent cases), respondent, secret, solicit, state, tribunal, and United States.

The word "individual" is used in the proposed rules being considered to mean a natural person and would not include juristic entities. The definition of "person" is similar to the definition of "person" in 1 U.S.C. 1. "Attorney" is defined to mean an individual who is a member in good standing of the bar of a United States court or the highest court of any State. This definition differs from the present definition in §2.12. The proposed defi-

nition being considered would include an attorney who may be a member of one bar in good standing and "under . . . [an] order of any court suspending, enjoining, restraining, disbarring, or otherwise restricting" the attorney from practice before the bar of another state. The broader definition being considered is believed necessary in view of 5 U.S.C. 500(b) which provides that "[a] n individual who is a member in good standing of the bar of the highest court of *a* State may represent a person before an agency * * * *." Thus, an attorney disbarred in one state and in good standing in a second state would appear to meet the requirements of 5 U.S.C. 500(b). Compare 31 CFR §10.2(b) (1983) defining attorney in the rules of practice before the Internal Revenue Service. The attorney nevertheless could be excluded to practice before the PTO, 5 U.S.C. 500(d) (2), after notice and opportunity for a hearing. See *Selling* v. *Radford*, 243 U.S. 46 (1917). "Affidavit" is defined to include affidavits, declarations under 35 U.S.C. 25 and 37 CFR §§1.68 or 2.20, and statutory declarations under 28 U.S.C. 1746.

Section 10.2 would provide for a Director of Enrollment and Discipline ("Director"). The duties of the Director are set out in the proposed rule being considered. Any final decision of the Director refusing to register an individual, specially recognize an individual, or reinstate a suspended or excluded practitioner would be reviewable by petition to the Commissioner on the record made before the Director. A fee would be charged; the amount of the fee has not been determined, but would be set out in any notice of proposed rulemaking which follows this advance notice.

Section 10.3 would provide for a Committee on Enrollment to assist the Director in connection with registration of attorneys and agents. One of the principal functions of the Committee on Enrollment would be assisting the Director prepare and grade an examination (see §10.7(b)).

Section 10.4 would add a new concept in disciplinary proceedings in the PTO. The section would provide for a Committee on Discipline. The Committee would comprise the Director and at least two Associate Solicitors in the Office of the Solicitor. As provided in paragraph (b) of §10.4, the Committee would meet at the request of the Director. The Committee would determine by majority vote whether there is probable cause to initiate a disciplinary proceeding against a practitioner. The two Associate Solicitors would act independently of the Solicitor. The rationale behind this latter provision is to leave the Solicitor and other members of the Solicitor's staff free to advise the Commissioner as to the proper disposition of a disciplinary proceeding after an appeal (§10.155) is filed following an initial decision (§10.154) of an ALJ. Under §1.348, the Solicitor presently files charges and thus cannot advise the Commissioner as to a proper disposition of a disciplinary proceeding. See 5 U.S.C. 557(d) (1). Accordingly, under the proposed rules being considered, the Solicitor and the staff of the Solicitor's Office which is not part of the Committee on Discipline would be insulated from the activities of the Director and the Committee on Discipline.

Under §10.4(c), discovery could not be had of deliberations of the Committee on Discipline. See *Morgan* v. *United States*, 313 U.S. 409, 422 (1941). The Committee on Discipline would function in the nature of a Grand Jury. Accordingly, under the proposed rules being considered, a disciplinary proceeding would not be a trial of whether the Committee on Discipline had a reasonable basis for its action; rather, the disciplinary proceeding would resolve whether the respondent has or has not committed the violations alleged in the complaint which the Committee on Discipline authorized to be filed under § 10.134.

Under §10.5, a single register of attorneys and agents registered to practice before the PTO would be kept. The proposed rule being considered would conform the rules to what actually occurs today inasmuch as only a single register of all registered attorneys and agents is kept in fact.

Section 10.6 would provide for registration of individuals to practice before the PTO in patent cases.

Paragraphs (a) and (b) of §10.6 would provide for registration of attorneys and agents, respectively. Citizens of the United States could be registered regardless of their residence. Resident aliens, under appropriate circumstances, *could* be registered by the Director. Registration of permanent resident aliens would be consistent with *In re Griffiths*, 413 U.S. 717 (1973) (permanent resident alien entitled to be admitted to Bar of Connecticut notwithstanding status as an alien). See also *Raffaelli* v. *Committee of Bar Examiners*, 496 P.2d 1264 (Cal. 1972) and *Application of Park*, 484 P.2d 690 (Alaska 1971). The PTO currently registers permanent resident aliens. See *In re Bhogaraju*, 178 USPQ 628 (Comm'r.Pat. 1973); *In re Bramham*, 181 USPQ 723 (Comm'r.Pat. 1974); and *In re Keen*, 187 USPQ 477 (Comm'r.Pat. 1975).

The proposed rules being considered would, however, restrict the circumstances under which an alien could be registered. Registration would be precluded if the practice of patent law before the PTO is inconsistent with the terms of any visa under which the alien was admitted to and continues to reside in the United States. See e.g., *In re Richardson*, 203 USPQ 959 (Comm'r.Pat. 1977) (alien admitted to U. S. with an H-3 visa for training could not practice patent law under the terms of the visa) and *In re Mikhail*, 202 USPQ 71 (Comm'r.Pat. 1976) (alien admitted to U. S. with B-1/B-2 visa and visiting the U. S. temporarily for business or pleasure could not practice patent law under terms of visa). While certain aliens should not be registered, it may nevertheless be appropriate to grant an alien limited recognition under §10.9. See e.g., *In re Messulam*, 185 USPQ 438 (Comm'r.Pat. 1975) (alien admitted to U. S. with L-1 visa for purpose of rendering service to a single company for whom the alien had previously worked abroad and who would remain in the U. S. temporarily could not practice, but could be given limited recognition). See also *In re Gresset*, 189 USPQ 350 (Comm'r.Pat. 1976).

An alien who is registered and who thereafter ceases to reside in the United States would be removed (after notice and opportunity for a hearing) unless the alien is otherwise qualified to be registered on the basis of reciprocity under paragraph (c) of §10.6.

Paragraph (c) of §10.6 would continue to provide for registration of foreigners who do not reside in the United States. A practitioner who is suspended from practice before the patent office in the country where he or she resides would also be suspended from practice before the PTO. See *In re Walton*, 956 *Official Gazette* 346 (Mar. 8, 1977) and *In re Cavanagh*, 979 *Official Gazette* 22 (Feb. 20, 1979).

Paragraph (d) of §10.6 would continue the practice under 37 CFR §1.341(f) of restricting registration of empolyees of the United States. See 41 Op. Att'y. Gen. 21 (1949), *reprinted in* 1949 Dec. Comm'r. Pat. 1.

Paragraph (e) of §10.6 would continue certain restrictions on practice of patent law before the PTO by former patent examiners and other former PTO empolyees. Every former employee who sought registration or reinstatement (if registered prior to becoming a PTO employee) would be required to sign a written statement indicating that he or she had read 18 U.S.C. 207.

Section 10.7 would provide for the requirements for registration. The requirements would be essentially the same as the present requirements under 37 CFR §1.341(c). The examination would not be administered as a mere academic exercise. See *In re Mikhail*, 202 USPQ 71 (Comm'r.Pat. 1976). Thus, the examination will not be administered to any individual who cannot be registered or given limited recognition. Paragraph (c) of §10.7 would provide in the rules for a procedure for seeking regrading of an examination failed by an applicant. A fee would be charged, the amount of which would be determined in the future and announced in a notice of proposed rulemaking.

Section 10.8 would continue the practice under 37 CFR §1.341(h) of requiring an oath and payment of a

fee prior to registration.

Section 10.9 would continue to provide for limited recognition of individuals under appropriate circumstances. Paragraph (b) would codify in the Code of Federal Regulations the Commissioner's decisions in *In re Messulam* and *In re Gresset*, both of which are discussed above.

Section 10.10 would continue the present provisions of 37 CFR §1.343.

Section 10.11 would continue the present practice under 37 CFR §1.347. The PTO would continue the practice of requiring a registered practitioner to take and pass an examination if the registered practitioner is removed for a substantial period under §10.11. See Commissioner's Notice of Aug. 21, 1978, "Reinstatement of Patent Attorneys and Agents Registered to Practice before the U. S. Patent and Trademark Office," 974 *Official Gazette* 14 (Sept. 19, 1978).

Section 10.14 would set forth who may practice before the PTO in trademark and other non-patent cases. Section 10.14, in essence, would continue present practice under 37 CFR §2.12, except that the definition of attorney is changed. See the discussion above under §10.1. The change in the definition of attorney is believed necessary in view of 5 U.S.C. 500 (b) and the fact that an individual may be an attorney in good standing in one state even though suspended in another state. In other non-patent cases, e.g., disciplinary proceedings or proceedings to disqualify counsel in an *ex parte* or *inter partes* patent or trademark case, a party could be represented only by an attorney.

Section 10.15 would provide that practitioners (individuals who practice before the PTO in patent, trademark, or other non-patent cases) could be suspended or excluded.

The Commissioner has authority under 35 U.S.C. 32 to suspend or exclude practitioners registered to practice before the PTO in patent cases. See also 5 U.S.C. 500(e).

The Commissioner also has authority to suspend or exclude practitioners who practice before the PTO in trademark and other non-patent cases. 5 U.S.C. 500(d)(2); *Herman*, v. *Dulles* 205 F.2d 715 (D.C. Cir. 1953); and Attorney General's Manual on the Administrative Procedure Act, pp. 65-66 (1947). See also *Harary* v. *Blumenthal*, 555 F.2d 1113 (2d Cir. 1977) (certified public accountant disbarred from practice before IRS) and *Koden* v. *U. S. Department of Justice*, 564 F. 2d 228 (7th Cir. 1977) (attorney suspended from practicing before Immigration and Naturalization Service).

Section 10.18 would continue present practice under 37 CFR §1.346 and 37 CFR §2.15. The practice is similar to that under Rule 11 of the Federal Rules of Civil Procedure. See also §10.23(c) (15).

Sections 10.20 through 10.112 would establish a PTO Code of Professional Responsibility. Presently, practitioners representing parties in patent and trademark cases are required to conform to the standards of ethical and professional conduct set forth in the Code of Professional Responsibility of the American Bar Association as amended Feb. 24, 1970. The 1970 ABA Code is incorporated by reference into the PTO rules. See 37 CFR §1.344 and 37 CFR §2.13. The PTO believes that it may be more desirable to create a PTO Code of Professional Responsibility which would be applicable to those practicing before the PTO and to set forth the PTO Code in the Code of Federal Regulations. Many practitioners have advised the PTO that they do not have ready access to the 1970 ABA Code and would prefer that the rules governing standards of ethical and professional conduct be published in the Code of Federal Regulations as part of the PTO rules.

In addition to the 1970 ABA Code, practitioners have been subject to strict advertising standards (37 CFR §1.345 and 37 CFR §2.14) which have been outdated by decisions of the Supreme Court. See *Bates* v. *State Bar of Arizona*, 433 U.S. 350 (1977); *In re Primus*, 436 U.S. 412 (1978); and *In re R.M.J.*, 455 U.S. 191 (1982). Sections 1.345 and 2.14 have not been enforced since *Bates*.

Section 10.20 would define Canons and Disciplinary Rules. The Canons and Disciplinary Rules for the most part were derived from the Model Code of Professional Responsibility of the American Bar Association (1980). See Table 2 for the principal source of each section of the PTO Code being considered. Ethical considerations of the 1980 ABA Code have not been included because they are "aspirational" in character.

The "Disciplinary Rules" would be mandatory in character and would state the minimum level of conduct expected of practitioners before the PTO. Sections 10.21 through 10.112 would constitute the PTO Code of Professional Responsibility. The PTO Canons and Disciplinary Rules are for the most part self-explanatory and generally known by practitioners. A few additional comments will be made with respect to certain Disciplinary Rules to enable interested persons to better understand why the proposed Disciplinary Rules are being considered.

Section 10.23 would define misconduct.

Paragraph (a) of §10.23 is based on 35 U.S.C. 32 and would prohibit disreputable or gross misconduct. For an example where a practitioner was excluded for gross misconduct, see *In re Wedderburn*, 1897 Dec. Comm'r. Pat. 77 (Comm'r. Pat. 1897), *mandamus denied sub nom., United States ex rel. Wedderburn* v. *Bliss*, 1897 Dec. Comm'r. Pat. 750 (Sup.Ct. D.C. 1897), *aff'd*, 12 App.D.C. 485, 1898 Dec. Comm'r. Pat. 413 (D.C. Cir. 1898).

Paragraph (b) of §10.23 would be essentially the same as DR 1-102(A) of the 1980 ABA Code. Subparagraph (b) (3) of §10.23 (b) would prohibit a practitioner from engaging in illegal conduct involving moral turpitude. Members of the bar have expressed different views as to whether any PTO Code of Professional Responsibility should contain such a provision. The present rules contain such a provision. See 37 CFR §1.344, 37 CFR §2.13, and DR 1-102(A)(3) of the 1970 Code of Professional Responsibility of the American Bar Association. The PTO presently believes that a majority of practitioners would favor retaining such a provision. Several states have a similar provision and recently have taken disciplinary action based on violation of the provision. See e.g., *Florida Bar* v. *Lord*, 433 So.2d 983 (Fla. 1983) (attorney disciplined for failure for 22 years to file income tax returns); *Florida Bar* v. *Wilson*, 425 So.2d 2 (Fla. 1983) (attorney disciplined for solicitation to traffic in cocaine); *In re Robertson*, 429 A.2d 530 (D.C. App. 1981) (attorney disciplined for conspiring to sell narcotic drugs and to receive and conceal narcotic drugs); *In re Wines*, 660 P.2d 454 (Ariz. 1983) (attorney disciplined for willful failure to supply information relating to income tax); *In re Levinson*, 444 N.E. 2d 1175 (Ind. 1983) (attorney disbarred, inter alia, for indecent exposure and related acts—444 N.E.2d at 1176, col. 1); and *In re Phillips*, 452 A.2d 345 (D.C. App. 1982) (attorney disbarred based on rape and sodomy).

Paragraph (c) of §10.23 would define *some*, but not all, acts which would constitute violations of paragraphs (a) and (b) of §10.23. The PTO believes that it would be helpful to practitioners if some specific prohibitions were set out in the rules. The prohibitions set out in subparagraphs (1) through (18) of §10.23(c) represent violations which have occurred in the past or which the PTO specifically seeks to prevent. The specific acts set out in paragraph (c) would not constitute a complete description of all acts which would be violations of paragraphs (a) and (b) of §10.23.

Subparagraph (1) of §10.23(c) would provide that misconduct includes being convicted of a criminal offense involving moral turpitude, dishonesty, or breach of trust. This subparagraph would continue present practice. See *In re Castorina*, 975 *Official Gazette* 14 (Oct. 10, 1978) (attorney excluded from PTO practice upon conviction under 18 U.S.C. §201(f)).

Subparagraph (5) of §10.23 (c) would provide for suspension or exclusion from practice before the PTO after entry of an order suspending or excluding a practitioner by a duly constituted authority of the United States (e.g., a federal court of another federal agency) or a

state (e.g., a state supreme court or a state bar). Suspension or exclusion from practice before the PTO based on disciplinary action by another tribunal would not occur prior to notice and opportunity for a hearing and would continue to be governed by the principles of *Theard* v. *United States*, 354 U.S. 278 (1957); *Selling* v. *Radford*, 243 U.S. 46 (1917); and *In re Thies*, 662 F.2d 771 (D.C. Cir. 1980). See *In re Davis*, 982 *Official Gazette* 2 (May 1, 1979), *aff'd. sub nom., Davis* v. *Commissioner*, No. 80-1036 (D.C. Cir. Mar. 31, 1981), *cert. denied*, 454 U.S. 1090 (1981) (attorney excluded by PTO based on disbarment in Minnesota, *Matter of Davis*, 264 N.W.2d 371 (Minn. 1977)); *In re Hodgson*, 1023 *Official Gazette* 13 (Oct. 12, 1982) (attorney excluded before the PTO after disbarment in Virginia); *In re Pattison*, 1023 *Official Gazette* 13 (Oct. 12, 1982) (attorney excluded by PTO after disbarment in Maryland, *Attorney Grievance Commission of Maryland* v. *Pattison*, 441 A.2d 328 (Md. 1982)); and *In re Kraft*, 954 *Official Gazette* 550 (Jan. 11, 1977), *aff'd. sub nom., Kraft* v. *Commissioner*, No. 77-0087 (D.D.C. Nov. 3, 1977) (attorney excluded from practice before PTO based on suspension order of the Supreme Court of Idaho).

Subparagraph (6) of §10.23(c) would include as misconduct aiding and abetting a practitioner, suspended or excluded from practice before the PTO, in engaging in the unauthorized practice of law before the PTO during a period of suspension or exclusion. See also §10.158.

Subparagraph (7) of §10.23(c) would include as misconduct knowingly withholding information identifying a patent or application of another from which one or more claims have been copied. This specific provision would provide a penalty for those knowingly violating the provisions of 37 CFR §1.205(b) or, if adopted, the provisions of §§1.604(b) and 1.607(c) of interference rules proposed Jan. 30, 1984, 49 F.R. 3768, 3787, 3788, 1039 *Official Gazette* 11, 83, 85 (Feb. 14, 1984).

Subparagraph (8) of §10.23(c) would address a problem which has occurred in at least one case in the PTO. Misconduct under this subparagraph would include failing to forward, or failing to notify the PTO of an inability to forward, to a client correspondence received from the PTO or the client's opponent in an *inter partes* proceeding before the PTO when the correspondence could have significant effect on a matter pending before the PTO under the conditions specified.

Subparagraph (9) of §10.23(c) would put practitioners on specific notice that misconduct includes misuse of a certificate of mailing under 37 CFR §1.8. See *In re Dula*, 1030 *Official Gazette* 20 (May 17, 1983) (attorney suspended for misusing certificate of mailing; see also BNA's Patent, Copyright, and Trademark Journal, Vol. 27, No. 658, p. 133 (Dec. 8, 1983)).

Subparagraph (10) of §10.23(c) would include as misconduct knowingly violating the duty of candor or good faith requirements of 37 CFR §1.56(a). See *In re Milmore*, 196 USPQ 628 (Comm'r. Pat. 1977) and *Kingsland* v. *Dorsey*, 338 U.S. 318 (1949).

Subparagraph (12) of §10.23(c) would provide that the following is misconduct: in the absence of information sufficient to establish a reasonable belief in the existence of probable cause that a practitioner is in violation of, or has violated, a Disciplinary Rule, causing a disciplinary investigation to be made, or a disciplinary proceeding to be brought, against the practitioner by a court, a state, or an administrative agency.

Subparagraph (15) of §10.23(c) is based on 37 CFR §1.346 and 37 CFR §2.15. The "scandalous and indecent matter" provision is based on Rule 11 of the Federal Rules of Civil Procedure.

Subparagraph (17) of §10.23(c) would include as misconduct representing before the PTO in a patent case either a joint venture comprising an inventor and an invention developer or an inventor referred to the registered practitioner when (i) the registered practitioner knows, or should have reasonably known, that a formal complaint filed by a federal or state agency, based on any violation of any law relating to securities, unfair methods of competition, unfair or deceptive acts or practices, mail fraud, or other civil or criminal conduct, is pending before a federal or state court or federal or state agency, or has been resolved unfavorably by such court or agency, against the invention developer in connection with invention development services and (ii) the registered practitioner fails to fully advise the inventor of the existence of pending complaint or unfavorable resolution thereof prior to undertaking or continuing representation of the joint venture or inventor. Federal agencies empowered to investigate and file charges relating to violations included within the rule being considered would include, for example, the Securities and Exchange Commission, the Federal Trade Commission, and the U.S. Department of Justice. See e.g., *Securities and Exchange Commission* v. *Lawrence Peska Associates, Inc.*, Civil Action 77-2436 (S.D.Fla. Filed: Aug. 8, 1977) and *United States* v. *Beecroft*, 608 F.2d 753 (9th Cir. 1979) (defendant officers in a company which helped inventors to promote and market their ideas convicted of mail fraud). State agencies which might file charges relating to violations included within the rule being considered would include an attorney general of a state. See e.g., Thomas, *Invention Development Service and Inventors: Recent Inroads on Caveat Inventors*, 60 J. Pat. Off. Soc'y. 355, 376 n. 75 (1978); Shemin, *Idea Promoter Control: The Time Has Come*, 60 J. Pat. Off. Soc'y. 261, 262 n. 7 (1978); and *Illinois* v. *Lawrence Peska Associates, Inc.*, Civil Action No. 77 CH 3771 (Cir.Ct. Cook County Filed: June 8, 1977). Thus a registered practitioner who (1) represents an inventor and an invention developer, (2) knows or should have known that the invention developer was charged by the FTC under the circumstances described in *In re the Matter of the Raymond Lee Organization, Inc.*, 92 F.T.C. 489 (1978), *aff'd. sub nom., Raymond Lee* v. *Federal Trade Commission*, 679 F.2d 905 (D.C. Cir. 1980), could be subject to disciplinary action under the proposed rule being considered if the practitioner does not advise the inventor of the existence of the charges.

In defining the terms "invention developer," "invention development services," "invention development," "customer," and "contract for invention development services," the PTO has relied on the Virginia Code, §59.1-208 (1982) (Repl. Vol. 1982) and has adopted suggestions made by Thomas, *supra* at pp. 388–389.

Paragraph (d) of §10.23 would provide that a practitioner who acts with reckless indifference to whether a representation is true or false would be chargeable with knowledge of its falsity. Likewise, deceitful statements of half-truths or concealment of material facts would be deemed actual fraud within the meaning of the Disciplinary Rules. See e.g., *United States* v. *Beecroft*, 608 F.2d 753 (9th Cir. 1979).

Section 10.24 would require a practitioner possessing unprivileged knowledge of a violation of a PTO Disciplinary Rule to report the violation to the Director. This section would also require practitioners to cooperate with tribunals, including the PTO, in connection with investigations of practitioners by those tribunals. See also §10.23(c) (16).

Section 10.31 would set out prohibited advertising. Paragraph (a) of §10.31 is based on 35 U.S.C. 32 and prohibits advertising which is specifically precluded by statute. Paragraph (b) of §10.31 is based on 5 U.S.C. 501 which prohibits the use of the name of a Member of Congress or of an individual in the service of the United States in advertising the practitioner's practice before the PTO. Paragraph (c) of §10.31 would continue the present practice of 37 CFR §1.345(c) by prohibiting registered patent agents from holding themselves out as qualified to practice general law or practice before the PTO in trademark cases.

Section 10.32 would provide guidelines relating to advertising. Paragraph (a) of §10.32 would indicate certain types of advertising in which a practitioner could engage. Paragraph (a) is not all inclusive. Any advertising which is not contrary to 35 U.S.C. 32 and which meets the standards announced in *Bates* would be proper. Paragraphs (b) and (d) of §10.32 would impose a record

keeping requirement when a practitioner advertises. The record keeping requirement does not compel a practitioner to create a record. The record keeping requirement is believed proper in the event it would become necessary to investigate whether advertising violates the provisions of 35 U.S.C. 32 or §10.31.

Section 10.33 is based on Rule 7.3 of the Model Rules of Professional Conduct of the American Bar Association (1983). Section 10.33 would be designed to prohibit "ambulance-chasing" in accordance with *Ohralik* v. *Ohio State Bar Ass'n.* 436 U.S. 447 (1978) (attorney disciplined for soliciting clients in person for pecuniary gain under circumstances evidencing undue influence, intimidation, or overreaching).

Section 10.34 would continue to authorize registered patent attorneys to use the designation "patent attorney" or similar designation. Likewise, registered patent agents could continue to use the designation "patent agent" or similar designation.

Section 10.40 would provide for the circumstances under which a practitioner could or should withdraw from employment. The section continues present practice.

Section 10.47(a) would provide that a practitioner shall not aid a non-practitioner in the unauthorized practice of law before the PTO. Paragraph (b) of §10.47 would further prohibit a practitioner from aiding a suspended or excluded practitioner in the unauthorized practice of law. See also §10.23(c) (6). Paragraph (c) of §10.47 would prohibit a practitioner from aiding a nonlawyer in the unauthorized practice of law. Thus, a registered patent practitioner who aids an invention developer under the circumstances outlined in *Lefkowitz* v. *Lawrence Peska Associates, Inc.*, 393 N.Y.S.2d 650 (Sup.Ct. N.Y. 1977) could be subject to discipline for violating this section.

Section 10.49 would continue present practice. An attorney who practices before the PTO and another attorney who does not practice before the PTO could form a partnership to practice law in a state, because the other attorney falls within the definition of practitioner. See §10.1(c).

Section 10.57 would continue present practice with respect to preservation of "confidences" and "secrets." Under §10.57(a), a "confidence" is information protected by the attorney-client or agent-client privilege under applicable law. The privilege is applicable in certain cases to communications between agents registered to practice before the PTO in patent cases and their clients. See *In re Ampicillin antitrust Litigation*, 81 F.R.D. 377, 392–394 (D.D.C. 1978). Nothing in §10.57 would alter the obligation of a practitioner to report and reveal information required under §§10.23 and 10.24 or any other Disciplinary Rule.

Sections 10.62 and 10.63 would continue present practice with respect to refusing or continuing employment when the interests of a practitioner may impair his or her independent professional judgment. Under §10.62(b) (3), a registered practitioner representing an inventor could normally sign and file a Rule 131 (37 CFR §1.131) affidavit describing his or her attorney diligence. Likewise, the registered practitioner could normally testify in an interference proceeding when his or her attorney diligence is an issue in the interference. The PTO would continue to assess on a case-by-case basis the weight to be given testimony by a registered practitioner who also represents a party in the proceeding in which the registered practitioner gives testimony. See *Wilder* v. *Snyder*, 201 USPQ 927, 934 (Bd.Pat.Int. 1979).

Section 10.66 would continue present practice. Paragraph (c) of §10.66 would further support the requirements of §10.23(c) (17).

Section 10.68 would continue present practice. Paragraph (b) of §10.68 would also support the requirements of §10.23(c) (17).

Section 10.77 would continue present practice. The PTO has disciplined practitioners for neglecting legal matters entrusted to them and for incompetence. See e.g., *In re Frank*, 1023 *Official Gazette* 13 (Oct. 12, 1982) (agent suspended for neglecting to file a response to an examiner's action and for misstating facts in a request for an extension of time); *In re Wyden*, 973 *Official Gazette* 40 (Aug. 22, 1978) (agent suspended for general incompetence in handling patent applications); and *In re Paley*, 961 *Official Gazette* 48 (Aug. 30, 1977) (agent suspended for improper handling of patent application). Under paragraph (c) of §10.77, "neglect" could include a single instance of neglect. Thus, the PTO would not adopt Informal Opinion 1273 (1973) of the American Bar Association or suggestions such as that in Manson, *Helping Lawyers Who Need Help (But Won't Ask for It!)*, 25 Va. Bar News 27 (June 1977).

Section 10.84 would continue present policy. Under §10.84(b) (1) it should be noted that a practitioner could continue to exercise professional judgment to waive or fail to assert a right or position of a client. Such a policy is believed to be entirely consistent with *Link* v. *Wabash R.R.*, 370 U.S. 626, 633-34 (1962); *Johnson* v. *Department of the Treasury*, No. 83-684, slip op. at 8 (Fed. Cir. Nov. 18, 1983)

Section 10.85 would continue present practice. Subparagraph (3) of §10.85(a) would continue to prohibit a practitioner from concealing or knowingly failing to disclose that which he or she is required by law to reveal. See e.g., §10.23(a), (b)(4), (c)(2)(ii) (setting forth a practitioner's duty of candor and good faith under 37 CFR §1.56(a)), and (c)(16); §10.24; and §10.85(b). The PTO has disciplined practitioners for failing to reveal evidence required by law to be disclosed. See *In re Milmore*, discussed above.

Subparagraph (5) of §10.85(a) would continue to prohibit a practitioner from knowingly making a false statement of law or fact. The PTO has disciplined practitioners for making false statements of fact. See *In re Dubno*, 1959 *Official Gazette* 25 (June 21, 1977) (attorney disciplined for making false statements in attempting to secure filing date of application under 37 CFR §1.47).

Under Subparagraph (7) of §10.85(a), a practitioner would not be able to destroy a document or other material that the practitioner knows or should know is relevant to a pending proceeding in the Office or a proceeding in the Office that is reasonably forseeable. Likewise, a practitioner would not be able to counsel, advise, or assist another in destroying such a document. This provision does not appear in the 1980 Model Code of Professional Responsibility of the American Bar Association, but would be included in the PTO Code of Professional Responsibility. The provision is based in part on *In re Williams*, 23 N.W.2d 4, 9 (Minn. 1946). See also *In re Osofsky*, 18 N.Y.S.2d 8 (App. Div. 1940), *reinstatement denied*, 43 N.Y.S.2d 273 (App. Div. 1943). Subparagraph (7) of §10.85(a) would make explicit in the PTO Code a provision which some maintain is implicit in the 1980 ABA Code. See e.g., Fedders, *Document Retention and Destruction: Practical, Legal, and Ethical Considerations*, 56 Notre Dame Law. 5, 59-60 (1980).

Section 10.89(b) would provide for standards of conduct in proceedings before the PTO. Paragraph (a) of §10.89 would prohibit a practitioner from disregarding or advising a client to disregard either (1) the rules of practice in patent or trademark cases or (2) orders entered by the PTO in particular cases or proceedings in which the practitioner participates in a representative capacity.

Subparagraph (1) of §10.89(b) would require a practitioner to reveal to the PTO known authority directly adverse to the position of a client unless the authority is cited by opponent or an employee of the PTO on the record of the proceeding. Some states seemingly have relaxed their disciplinary codes in this area. See e.g. DR 7-105 of the Virginia Code of Professional Responsibility (1984) and compare Virginia's 1976 version of DR 7-106(B)(1), 216 Va. 1120 (1976). All of the decisions made by the PTO in patent and trademark cases affect the public interest. *Lear* v. *Atkins*, 395 U.S. 653 (1969); *In re E.I. duPont de Nemours & Co., Inc.*, 476 F.2d 1357, 177 USPQ 563 (CCPA 1973); and 41 Op. Att'y Gen. 21 (1949). Many of the decisions made by the PTO are made *ex parte*. Accordingly, the PTO feels that practi-

tioners should cite to the PTO known authority which is contrary to a position being taken by the practitioner in the PTO. The practitioner could, of course, argue in good faith that any cited authority should not be followed or should be overruled.

Subparagraph (6) of §10.89 would prohibit a practitioner from engaging in undignified or discourteous conduct which is degrading to a tribunal. A tribunal includes the Office, courts, and other adjudicatory bodies. The PTO has disciplined a practitioner for engaging in undignified and discourteous conduct. See *In re Paley*, 1961 *Official Gazette* 48 (Aug. 30, 1977) (agent suspended for making unfounded and scandalous allegations against employees of the PTO and two judges of the United States Court of Appeals for the District of Columbia Circuit). See also 37 CFR §1.3.

The provisions of DR 7-107 of the Code of Professional Responsibility which were held unconstitutional in *Hirschkop* v. *Snead*, 594 F.2d 356 (4th Cir. 1979), have not been included in the proposed PTO Code of Professional Responsibility being considered.

Section 10.111 would provide that a practitioner should avoid an appearance of impropriety. Paragraph (b) of §10.111 would provide that a practitioner should not accept private employment in a matter in which he or she had substantial responsibility while a public employee. See 18 U.S.C. 207. Appropriate insulation of a newly hired practitioner who joins a firm would be appropriate under §10.111. In applying §10.111 the PTO would continue to follow the principles announced in *AH JU Steel Co., Ltd.* v. *Armco, Inc.*, 680 F.2d 751 (CCPA 1982); *Sierra Vista Hospital, Inc.* v. *United States*, 639 F.2d 749 (Ct. Cl. 1981); *Armstrong* v. *McAlpin* 625 F.2d 433 (2d Cir. 1980) (en banc), *vacated*, 449 U.S. 1106 (1981); *General Electric Co.* v. *United States*, 215 Ct. Cl. 928 (1977); and *Kesselhaut* v. *United States*, 555 F.2d 791 (Ct. Cl. 1977).

Section 10.112 would continue present policy under 37 CFR §1.344.

During the comment period after publication of the Aug. 11, 1983, Federal Register notice proposing to amend the attorney disciplinary rules, there were some who questioned whether the proposed rules would be made to apply to PTO personnel. The proposed Code of Professional Responsibility would not be applicable to employees of the PTO. PTO employees are governed by a code of employee responsibilities and conduct of the Department of Commerce. See Part O of Title 15 of the Code of Federal Regulations, 15 CFR §§0.735-1 through 0.735-41 (1984).

Sections 10.130 through 10.161 would establish a procedure for handling disciplinary proceedings.

In the past responsibility for investigating and prosecuting disciplinary proceedings has been with the Solicitor and the staff of the Office of the Solicitor. See 37 CFR §1.348. Since the Solicitor has been the investigator and the individual filing charges, the Solicitor and his staff have not been available to give legal advice to the Commissioner with respect to particular disciplinary cases. See 5 U.S.C. 557(d) (1).

While there is currently a defined procedure for handling disciplinary cases, it is very broad. Attorneys defending practitioners in disciplinary cases have complained that the procedure is not sufficiently defined. Procedure has been developed on a case-by-case basis. Officials appointed to preside at the hearing of disciplinary cases have included the Commissioner, Deputy Commissioner, and others, such as examiners-in-chief of the Board of Appeals. More recently, the PTO has used an administrative law judge (ALJ) of the Department of Commerce.

There are approximately 12,500 registered patent attorneys and agents. Numerous other attorneys practice before the PTO in trademark and other non-patent cases. The bar which practices before the PTO is nationwide. The large nationwide bar and small size of the Solicitor's staff has made it difficult to devote sufficient time to reasonably investigate complaints and, where appropriate, prosecute disciplinary proceedings.

Table 4 and the discussion immediately following Table 4 summarize the PTO disciplinary proceedings since 1976, which resulted in disciplinary action. Despite the size of the bar practicing before the PTO, the number of disciplinary proceedings is relatively small given the nationwide PTO bar. The geographic nature of the PTO bar makes it difficult for the PTO to investigate complaints with a part-time staff. Accordingly, the proposed rules being considered would create investigating authority in the Director of Enrollment and Discipline. The proposed rules being considered would also (1) insulate the Solicitor from duties of investigating and prosecuting disciplinary matters, thus rendering the Solicitor free to provide legal advice to the Commissioner, (2) establish procedure for handling disciplinary proceedings, and (3) provide for record keeping of disciplinary proceedings.

Paragraph (a) of §10.130 would provide for reprimands, suspensions, and exclusions. The term "exclude," rather than "disbar," is used throughout the proposed rules being considered, because "exclude" is used in 35 U.S.C. 32. Paragraph (a) of §10.130 is based on 35 U.S.C. 32 and 5 U.S.C. 500(d) (2). Paragraph (b) of §10.130 would provide that motions to disqualify counsel in PTO proceedings would continue to be handled on a case-by-case basis. *SEC* v. *Chenery Corp.*, 332 U.S. 194, 203 (1974). For a discussion of PTO disqualification proceedings, see "Attorney Disqualification Cases in the PTO," 62 J. Pat. Off. Soc'y 625 (1980). See also Note, Developments in the Law—Conflicts of Interest in the Legal Profession, 94 Harv. L. Rev. 1244 (1981) and the cases cited above in connection with the discussion of §10.111.

Section 10.131 would authorize the Director to investigate possible violations of PTO Disciplinary Rules. Paragraph (b) of §10.131 would require practitioner to report and reveal certain knowledge and evidence to the Director and to cooperate with the Director in connection with any disciplinary proceeding. Paragraph (c) of §10.131 would provide that non-practitioners could report violations to the Director. The Director would have discretion to require a non-practitioner to make a report of a violation in the form of an affidavit.

Section 10.132 would provide for a procedure for initiating a disciplinary proceeding and for referring the proceeding to an ALJ.

Under paragraph (2) of §10.132, when the Director would be of the opinion that there is probable cause to believe that a Disciplinary Rule had been violated, the Director would determine whether a practitioner should be given a notice under 5 U.S.C. 558(c). Section 558(c) provides, in part, "Except in cases of willfulness or those in which public health, interest, or safety requires otherwise, the withdrawal, suspension, revocation, or annulment of a license is lawful only if, before the institution of agency proceedings therefor, the licensee has been given—(1) notice by the agency in writing of the facts or conduct which may warrant the action; and (2) opportunity to demonstrate or achieve compliance with all lawful requirements." The provisions of 5 U.S.C. 558(c) do not apply to disciplinary proceedings in the PTO involving practitioners who are not registered inasmuch as the PTO does not issue a license to such practitioners. Likewise, where a practitioner willfully violates a Disciplinary Rule, notice and opportunity to demonstrate compliance is not needed. In certain cases, the public interest may require suspension of an incompetent practitioner or a practitioner who has been found guilty of a crime and committed to the custody of the Attorney General or has otherwise been incarcerated.

After giving notice under 5 U.S.C. 558(c), or if no notice is needed, the Director would call a meeting of the Committee on Discipline. The Committee on Discipline, comprising the Director and two Associate Solicitors, would determine by a majority vote whether there is probable cause to believe that a practitioner has violated a PTO Disciplinary Rule. If the Committee on Discipline determines that a violation has occurred, the Director would institute a disciplinary proceeding by filing

a "complaint" under §10.134. Upon the filing of a complaint, an Associate Solicitor who is a member of the Committee on Discipline, normally would prosecute the disciplinary proceeding on behalf of the Director. Upon the filing of a complaint, the disciplinary proceeding would be referred to an ALJ. A copy of the complaint would be forwarded to the ALJ. All papers filed in the disciplinary proceeding thereafter would be filed with the ALJ.

An ALJ would be used in disciplinary proceedings brought under 35 U.S.C. 32. The use of an ALJ is not required in disciplinary proceedings to suspend or exclude individuals from practice before the PTO in trademark and other non-patent cases. *Herman* v. *Dulles*, 205 F.2d 715 (D.C. Cir. 1958). Nevertheless, an ALJ is particularly qualified to handle disciplinary proceedings. Accordingly, as a matter of policy the PTO is currently using, and would continue to use, ALJs in handling all disciplinary cases.

Section 10.133 would permit conferences between practitioners and the Director. Paragraph (a) would provide for general conferences. Paragraph (b) would permit resignation from practice before the PTO to avoid institution or conclusion of a disciplinary proceeding. Paragraph (c) of §10.133 would permit settlement conferences. Past experience indicates that settlement conferences are desirable. Settlement of any controversy, particularly a disciplinary matter, is desirable. Accordingly, to permit both the Director and a respondent to discuss frankly and openly the possibility of settlement, no offer of settlement or refusal of an offer of settlement will be admissible in evidence unless both the Director and the respondent agree in writing.

Section 10.134 would set out the requirements of a complaint. A complaint would be deemed sufficient if it fairly informs the respondent of any violation of the Disciplinary Rules which form the basis for the disciplinary proceeding so that the respondent is able to answer. See *In re Ruffalo*, 390 U.S. 540 (1968).

Section 10.135 would provide for a method of serving a complaint. Service of complaints has been a problem in the past. Use of certified and registered mail has not always been satisfactory, because receipts are returned signed by individuals other than the respondent. Moreover, the PTO may have to resort to proving who signed a particular receipt. Accordingly, §10.135 provides that service may be accomplished by handing the complaint to the respondent. When service is by hand, the party serving the respondent shall file an affidavit with the Director. An alternative method for serving the complaint is to mail the complaint first-class or "Express Mail" to the last known address of the respondent. Although the proposed rule being considered does not so specify, under this rule the Director would probably attempt to contact the respondent shortly after mailing to determine whether the complaint had been received. A third method of service would be any method mutually agreeable to the Director and a respondent.

Under paragraph (b) of §10.135, if a complaint is returned by the Postal Service, a second complaint would be mailed. If the second complaint is returned, a notice would be published in the *Official Gazette* for four consecutive weeks. Any time for answering would run from the fourth publication of the notice.

Under paragraph (c) of §10.135, a letter under §10.11(b) could be served with the complaint. This practice has been used lately by the PTO and is the most satisfactory method of serving complaints. If a response is not timely submitted to a letter under §10.11(b), a registered practitioner is removed from the register. Such removal moots any disciplinary proceedings. Reinstatement after such removal would not be automatic. A respondent would have to demonstrate that he or she should be reinstated in light of the complaint filed under §10.134.

Under paragraph (d) of §10.135, if a respondent is represented by an attorney at the time a complaint is filed, a copy of the complaint would be served on the respondent's attorney. This practice is currently followed in the PTO. See also 5 U.S.C. 500(f).

Section 10.136 would provide for an answer to a complaint. Under paragraph (a) of §10.136, an answer would be due within thirty (30) days unless extended for up to no more than thirty (30) additional days by the ALJ. Under Paragraph (c) of §10.136 the content of the answer would be the same as under the current practice. See 37 CFR §1.348(c).

Under §10.137, false statements in an answer could be made the basis of supplemental charges. This section would continue the practice under the last sentence of 37 CFR §1.348(c).

Section 10.138 would provide that on the filing of an answer, a disciplinary proceeding would become a contested case within the meaning of 35 U.S.C. 24. However, evidence obtained by a subpoena issued under 35 U.S.C. 24 would not be admissible in evidence or considered unless leave to proceed under 35 U.S.C. 24 is first obtained from the ALJ. Ordinarily, a subpoena under 35 U.S.C. 24 is needed when a witness will not voluntarily appear. Often subpoenas are issued to be sure that a witness appears—particularly if both counsel and the ALJ have to travel to hear the testimony of a witness. The PTO believes that approval by the ALJ prior to issuing subpoenas is highly desirable. Initially, the ALJ can determine whether the evidence is relevant and/or whether a third-party should be subjected to the inconvenience of a subpoena. In this respect, if the ALJ does not believe any proferred evidence is admissible, the ALJ may refuse to permit a party to proceed under 35 U.S.C. 24. If a party nevertheless caused a subpoena to issue, a motion to quash the subpoena would lie in the District Court which issued the subpoena. The proposed rule being considered would adopt the policy of *Sheehan* v. *Doyle*, 513 F.2d 895, 898, 185 USPQ 489, 492 (1st Cir.), *cert. denied*, 423 U.S. 874 (1975) and *Sheehan* v. *Doyle*, 529 F.2d 38, 40, 188 USPQ 545, 546 (1st Cir.), *cert. denied*, 429 U.S. 879 (1976), *rehearing denied*, 429 U.S. 987 (1976), while rejecting the policy announced in *Brown* v. *Braddick*, 595 F.2d 961, 967, 203 USPQ 95, 101–102 (5th Cir. 1979).

Section 10.139 would provide authority for the ALJ to take action. Paragraph (a) would define the ALJ. Paragraph (b) of §10.139 would set out the authority of the ALJ.

Under subparagraph (2) of §10.139(b), the ALJ would make rulings on motions. See also §10.143. The time for filing motions and oppositions would be set on a case-by-case basis. Obviously, if respondent and his or her attorney are located in the Washington, D. C. metropolitan area, less time is needed for filing oppositions than a case where a respondent and his or her attorney are located in Los Angeles, California. It should be noted that, under §10.142(e), an ALJ could require papers to be served by "Express Mail."

Under subparagraph (4) of §10.139(b), the ALJ may authorize the taking of depositions in lieu of personal appearance at a hearing. Whether such a deposition would be authorized would be within the discretion of the ALJ. If demeanor is an issue with a particular witness, the ALJ could exercise discretion and deny a request to take a deposition in lieu of appearance. When a deposition would be authorized by the ALJ, notice and taking of the deposition would be governed by §10.151(a).

Under subparagraph (8) of §10.139(b), the ALJ could adopt procedures for the orderly disposition of disciplinary proceedings. For example, the ALJ could require the Director and the respondent to file a pre-hearing brief setting out the names of the witnesses to be called, a summary of their expected testimony, and any factual issues believed to be in dispute. The ALJ could also require the parties to serve copies of the exhibits to be used in their respective cases-in-chief.

Under paragraph (c) of §10.139, the ALJ would exercise such control over the disciplinary proceeding as to normally issue an initial decision within six (6) months from the filing of the complaint. The ALJ, however, could issue an initial decision after six months if in his or her opinion there exist unusual circumstances which pre-

clude issuance of the initial decision within the six month period. The purpose of this provision would be to put parties on notice that the ALJ has authority to complete his or her work within six months and that the parties should plan to meet any time schedules set by the ALJ. In the past, delays in disciplinary proceedings have considerably delayed final decisions. This provision would be designed to minimize delays. Inasmuch as it would be expected that the ALJ would consult with the parties prior to setting times, it is not expected that the six months provision of this rule will work undue hardship on either the Director or the respondent.

Paragraphs (d) and (e) of §10.139 would preclude interlocutory appeals by the Director or respondent from an order of the ALJ except under limited conditions. Under subparagraph (1) of §10.139(d), the ALJ could permit interlocutory review of his or her order when the interlocutory order involves a controlling question of procedure or law as to which there is a substantial ground for a difference of opinion and an immediate decision by the Commissioner would materially advance the ultimate termination of a disciplinary proceeding. The standard would be the same as that of 28 U.S.C. 1292(b). There would be no stay of proceedings before the ALJ when an appeal is taken of an interlocutory order unless a stay is granted by the ALJ or the Commissioner. The PTO would intend under this section that stays would be granted only in the most compelling of circumstances. Parties would not be permitted to render the ALJ ineffective by filing appeals or requests for review of interlocutory orders.

Section 10.140 provides for representation of respondents and the Director.

Section 10.141 provides for the filing of papers. Paragraph (a) makes clear that the certificate of mailing practice under 37 CFR §1.8 is not applicable in disciplinary proceedings. Paragraph (b) provides that papers filed after the complaint and prior to entry of an initial decision would be filed with the ALJ. The ALJ would designate the address to which he or she would want papers mailed. The ALJ, however, could require in an appropriate circumstance, that papers be hand-delivered to his or her office. All papers filed after the initial decision would be filed with the Director and the Director would transmit to the Commissioner any paper which requires action by the Commissioner.

Section 10.142 would provide for the method of serving papers in disciplinary cases.

Section 10.143 would provide for filing of motions. No motion could be filed unless supported by a written statement that the moving party conferred with the other party for the purpose of resolving the issue raised in the motion and that agreement could not be reached. If an issue raised in a motion is resolved prior to decision on the motion by the ALJ, the parties would be required to notify the judge. This provision would save the ALJ time.

Section 10.144 would provide for hearings before the ALJ. The hearing would be transcribed and a copy of the transcript of the hearing would be provided, at PTO expense, to the Director and the respondent. If a respondent fails to appear at a hearing, the ALJ would be authorized to proceed in respondent's absence. Under paragraph (c), disciplinary hearings are normally not open to the public. The need for closed hearings in cases involving patent applications is occasioned in part by 35 U.S.C. 122. Apart from the PTO obligation to keep information concerning patent applications secret, until an attorney or agent is disciplined, it is believed that opening the hearings to the public would constitute a clearly unwarranted invasion of personal privacy. The fact that disciplinary proceedings are held in confidence, however, would not preclude the Director or respondent from approaching witnesses and providing those witnesses with sufficient information to determine whether they can give relevant testimony.

Section 10.145 would provide for a procedure for handling cases where there is a variance between the allegations in pleadings and the evidence. Any party would be given reasonable opportunity to meet any allegations in an amended complaint or answer. See *In re Ruffalo*, 390 U.S. 544 (1968).

Section 10.150 would provide for rules governing evidence. Under paragraph (a) of §10.150, the rules of evidence prevailing in courts of law and equity would not be controlling. This provision is bottomed on 5 U.S.C. 556(d) which provides, in part, that "[a]ny oral or documentary evidence may be received, but the agency as a matter of policy shall provide for the exclusion of irrevelant, immaterial, or unduly repetitious evidence." Thus, evidence in a disciplinary proceeding is not controlled by the Federal Rules of Evidence. *Klinestiver* v *Drug Enforcement Administration*, 606 F.2d 1128, 1130 (D.C. Cir. 1979). While most evidence admissible under the Federal Rules of Evidence would be admissible in a disciplinary proceeding, there is evidence which is not admissible under the Federal Rules of Evidence which may be admissible in a disciplinary proceeding. Paragraph (b) of §10.150 provide for admission into evidence of depositions taken under §10.151. Any deposition under§10.151(a) would have prior approval of the ALJ. A deposition under §10.151(b) would not have prior approval, but may or may not be admissible. Admissibility of the latter deposition is within the discretion of the ALJ. Under paragraph (c) of §10.150, PTO documents, records, and papers would not have to be certified to be admissible.

Section 10.151 provides for depositions. Under paragraph (a) of §10.151, either the Director or the respondent may move for leave to take a deposition of a witness in lieu of personal appearance of the witness before the ALJ. The ALJ is authorized to grant leave to take the deposition upon a showing of good cause. The taking of depositions under paragraph (a) would *not* be for the purpose of discovery. A deposition would be taken only when it is not possible or desirable for the ALJ to hear the witness in person. Under paragraph (b) of §10.151, the Director and the respondent could agree to take a deposition. Often depositions are desirable during settlement. The testimony of a witness may be "locked-in" through a deposition. Several disciplinary matters have been settled by the PTO in the past by using mutually agreed to depositions. However, under paragraph (b) of §10.151 the parties could not take depositions for use at a hearing without prior approval of the ALJ. This provision is deemed to be necessary to maintain control over the proceeding with the ALJ.

Section 10.152 provides for limited discovery. Considerable thought has been given to discovery. There are cases which hold that discovery is not necessary in disciplinary proceedings. See e.g., *In re Murray*, 362 N.E.2d 128 (Ind. 1977); *In re Wireman*, 367 N.E.2d 1368 (Ind. 1977). There are those who advocate that discovery should be similar to that under the Federal Rules of Civil Procedure. Both views have been considered. The PTO believes that some discovery should be permitted. On the other hand, the wide scope of discovery under the Federal Rules of Civil Procedure, and the delays caused thereby are well-known. Under §10.152, the ALJ could require parties to file and serve, prior to any hearing, a pre-hearing statement which lists all proposed exhibits to be used in connection with the party's case-in-chief, a list of proposed witnesses, the identity of any government employee who investigated the case, and copies of memoranda reflecting respondent's own statements. This provision is patterned after *Silverman* v. *Commodity Futures Trading Commission*, 549 F.2d 28 (7th Cir. 1977).

The ALJ could determine when the discovery authorized by paragraph (a) of §10.152 should be made.

Subparagraph (1) of §10.152 would limit discovery to exhibits which a party intends to use as part of his or her case-in-chief. Exhibits not used in a party's case-in-chief, but which might be used to impeach or cross-examine the other party's witnesses would not have to be produced. If a document were to be used both in a case-in-chief and to impeach, it would have to be produced. Subparagraph (3) of §10.152(a) would provide for identi-

fying any government witness who investigated the matter. Respondent could then call the government witness. Subparagraph (4) of §10.152(a) would provide for producing copies of any statement made by a respondent.

Under paragraph (b) of §10.152 a party would be entitled to see any written statement made by a witness prior to cross-examination of the witness. Compare 18 U.S.C. 3500.

Under §10.153, the ALJ would afford the parties a reasonable opportunity to submit proposed findings and conclusions and a post-hearing memorandum. See 5 U.S.C. 557(c).

Under §10.154, the ALJ would file an "initial" decision. In rendering an initial decision, it would be expected that the ALJ would make appropriate reference to the administrative record in explaining an initial decision. See e.g., *Food Marketing Institute* v. *Interstate Commerce Commission*, 587 F.2d 1285, 1292 n. 20 (D.C. Cir. 1978). In the absence of an appeal to the Commissioner (see §10.155), the decision of the ALJ would become the final decision in the disciplinary proceeding. 5 U.S.C. 557(b).

Paragraph (b) of §10.154 would require the ALJ to explain the reason for any penalty. Four factors would guide the ALJ and the Commissioner in setting and approving penalties. The factors are the public interest, the seriousness of the violation of the Disciplinary Rule, the deterrent effects deemed necessary, and the integrity of the bar. These factors have been derived from numerous cases, including *Silverman* v. *Commodity Futures Trading Commission*, 562 F.2d 432, 439 (7th Cir. 1977) and *In re Merritt*, 363 N.E.2d 961, 971 (Ind. 1977). See also *Florida Bar* v. *Murrell*, 74 So.2d 221 (Fla. 1954). Past PTO disciplinary cases generally are not helpful in determining penalties. Often the penalties have not been explained in light of the factors which would be set out in paragraph (b) of §10.154. Moreover, there have been very few disciplinary proceedings in the PTO. Under the proposed rules being considered, a penalty would be a matter within the discretion of the ALJ with ultimate decision being with the Commissioner. The discipline in each disciplinary proceeding would be tailored for the individual case. *In re Wines*, 660 P.2d 454 (Ariz. 1983). Manifestly, the PTO would not expect perfection or absolute uniformity. *Id.* Likewise the PTO would not propose to permit relitigation of penalties imposed in prior cases. *Id.* Any case concluded in which the penalty is not explained (e.g. a settlement) would not serve as precedent.

Section 10.155 would provide for an appeal from an initial decision of the ALJ to the Commissioner. If an appeal is not taken, the initial decision of the ALJ would become the decision of the Commissioner. See §10.154(a). An appeal would be taken within 30 days of the initial decision of the ALJ. Any party opposing the appeal could file a brief in support of the opposition. Under paragraph (b) of §10.155, the Commissioner would decide the appeal on the record made before the ALJ.

Section 10.156 would provide for a decision by the Commissioner. The Commissioner could affirm, reverse, or modify an initial decision of an ALJ or remand the disciplinary proceeding to the ALJ for such further proceedings as the Commissioner may deem appropriate. The Commissioner's decision would be transmitted to the Director who in turn would forward a copy of the decision to respondent.

Section 10.157 would set out how judicial review could be had of any final decision of the Commissioner.

Section 10.158 would set out the limitations on a practitioner who is suspended or excluded from the practice of law before the PTO.

Paragraph (b) of §10.158 sets out what a practitioner would be required to do. Subparagraph (1) of §10.158(b) would require a suspended or excluded practitioner to notify all clients of the suspension and to file a copy of each notice to a client with the Director. Subparagraph (2) of §10.158(b) would require a practitioner, within thirty (30) days, to surrender a client's active case file to the client or another practitioner designated by the client. Under subparagraph (3) of §10.158(b), a suspended or excluded practitioner could not hold himself or herself out as authorized to practice law before the PTO. Subparagraph (4) of §10.158(b) would require a suspended or excluded practitioner to remove from directories published after suspension or exclusion any advertisement which would reasonably suggest to the public that the practitioner is authorized to practice before the PTO. The practitioner would be required to inform the Director of any action taken in this respect.

Subparagraph (5) of §10.158(b) would preclude certain advertising. Under subparagraph (6) of §10.158(b), a suspended or excluded practitioner would not render legal advice or services to any person having immediate, prospective, or pending business before the PTO as to that business. Subparagraph (7) of §10.158(b) would require a suspended or excluded practitioner to take steps to change signs and/or stationery to eliminate any suggestion that the practitioner is authorized to practice law before the PTO. Subparagraph (8) of §10.158(b) would require a suspended or excluded practitioner to return to any client any unearned funds, including any unearned retainer fee, and any securities and property of the client.

Paragraph (c) of §10.158 would provide the conditions under which a suspended or excluded practitioner could aid another practitioner in the practice of law before the PTO. Paragraph (d) of §10.158 would provide for affidavits and statements which would have to be made and filed by a suspended or excluded practitioner to be reinstated.

In the past, the conditions of a suspension or exclusion may not have been clear. Section 10.158 would make clear the restrictions for suspended or excluded practitioners. The provisions of §10.158 were derived from several cases, including *In re Christianson*, 215 N.W.2d 920 (N.D. 1974); *In re Hawkins*, 503 P.2d 95 (Wash. 1972); *Florida Bar* v. *Davis*, 397 So.2d 690 (Fla. 1981); *Florida Bar* v. *Thomson*, 310 So.2d 300 (Fla. 1975); *Florida Bar* v. *Thomson*, 354 So.2d 872 (Fla. 1978); *In re Kraus*, 670 P.2d 1012 (Ore. 1983); *In re Easler*, 272 S.E.2d 32 (S.C. 1980); *Crawford* v. *State Bar of California*, 7 Cal. Rptr. 746 (Cal. 1960); and *Ohio State Bar Ass'n.* v. *Hart*, 375 N.E.2d 1246 (Ohio 1978). Specifically considered, and rejected, was Guideline X of Provisional Order No. 18 of the Supreme Court of Rhode Island, 454 A.2d 1222 (1983), to the extent Guideline X is inconsistent with §10.158.

The PTO agrees with the Supreme Court of North Dakota to the extent that it holds a suspended or disbarred attorney "is not the same as a layman." 215 N.E.2d at 925, column 2. The same is true of a practitioner who is suspended or excluded from practice before the PTO. Accordingly, while §10.158 would permit a suspended or excluded practitioner to be employed by a practitioner, the suspended or excluded practitioner would nevertheless be precluded from taking some action which properly might be taken by a layperson or a para-legal. A suspended or excluded practitioner would have to be a salaried employee of the practitioner for whom he or she works and could not share profits. A suspended or excluded practitioner could not communicate directly with clients, render any legal advice, or meet with witnesses. A suspended or excluded practitioner could research the law, write patent or trademark applications (provided he or she did not interview clients or witnesses), or conduct patent or trademark searches. The provisions of §10.158 are considered appropriate if a suspension or exclusion is to have any significance.

Section 10.159 would provide for notice of suspension or exclusion. Under paragraph (a) of §10.159, upon issuance of an unfavorable final decision, the Director would give appropriate notice to employees of the PTO, United States courts, and the appropriate authorities of any State in which a suspended or excluded practitioner is known to be a member of the bar. In the case of a practitioner registered under §10.6(c), the Director

would also notify the patent office of the country where the practitioner resides. Under paragraph (b) of §10.159, the Director would publish an appropriate notice in the *Official Gazette*. Under paragraph (c) of §10.159, the Director would maintain records which would be available to the public concerning disciplinary proceedings. The files of most disciplinary proceeding which result in imposition of a reprimand, suspension, or exclusion are presently available for public inspection in the Office of the Director of Enrollment and Discipline. Public availability would continue under the proposed rules being considered subject to the removal of any information required by law to be maintained in secrecy.

Section 10.160 would provide for a petition for reinstatement. A petition for reinstatement of a practitioner suspended for less than five years would not be considered until the period of suspension had passed. Under paragraph (b) of §10.160, a petition for reinstatement of an excluded practitioner would not be considered until five years after entry of the order excluding the practitioner. Paragraph (c) of §10.160 would set out some of the conditions which the Director might impose upon a suspended or excluded practitioner seeking reinstatement. One of those conditions could include taking and passing the examination of §10.7(b). Another condition could be a requirement that the practitioner seeking reinstatement pay up to $1,500 of the costs of the disciplinary proceeding leading to suspension or exclusion.

Under paragraph (c) of §10.160, a suspended or excluded practitioner who had violated the provisions of §10.158 would not be reinstated prior to serving a suspension free of any violation. Under paragraph (d) of §10.160, proceedings for reinstatement would be open to the public and an appropriate notice that a suspended or excluded practitioner had applied for reinstatement would appear in the *Official Gazette*. Any comments from the public would be considered prior to reinstatement.

Section 10.161 would contain savings clauses.

Table 1
Principal Source of Sections 10.2 through 10.19

Sec.	
10.2(a)	New
10.2(b) (1)	New, but see 37 CFR 1.341(i) (1983)
10.2(b) (2)	New, but see 37 CFR 1.348(a) (1983)
10.2(c)	New, but see 37 CFR 1.341(i) (1983)
10.3	37 CFR 1.341(i) (1983)
10.4(a)	New
10.4(b)	New, but see 37 CFR 1.348(a) (1983)
10.5	37 CFR 1.341 (1983)
10.6(a)	37 CFR 1.341(a) (1983)
10.6(b)	37 CFR 1.341(b) (1983)
10.6(c)	37 CFR 1.341(e) (1983)
10.6(d)	37 CFR 1.341(f) (1983)
10.6(e)	37 CFR 1.341(g) (1983)
10.7(a), (b)	37 CFR 1.341(c) (1983)
10.7(c)	New
10.8	37 CFR 1.341(h) (1983)
10.9(a)	37 CFR 1.342 (1983)
10.9(b)	New
10.10	37 CFR 1.343 (1983)
10.11	37 CFR 1.347 (1983)
10.12	[reserved]
10.13	[reserved]
10.14	5 USC 500(b) and 37 CFR 2.12 (1983)
10.15	35 USC 32; 5 USC 500(d) (2); 37 CFR 1.343 (1983); and 37 CFR 2.12(f) (1983)
10.16	[reserved]
10.17	[reserved]
10.18(a)	37 CFR 1.346 (1983) and 37 CFR 2.15 (1983), see also Rule 11, FRCP
10.18(b)	35 USC 32 & Rule 11, FRCP
10.19	[reserved]

Table 2
Principal Source of Sections of 10.20 through 10.112, the PTO Code of Professional Responsibility

Sec.	
10.20	Preamble to MCPR (1980)
10.21	MCPR Canon 1 (1980)
10.22	MCPR DR 1-101 (1980)
10.23(a)	35 U.S.C. 32
10.23(b) (1)	35 U.S.C. 32 and MCPR DR 1-102(A) (1) (1980)
10.23(b) (2)-(6)	MCPR DR 1-102(A) (2)-(6) (1980)
10.23(c) (1)-(14)	PTO created
10.23(c) (15)	Rule 11, FRCP
10.23(c) (16)-(18)	PTO created
10.24	MCPR 1-103 (1980)
10.25 through 10.29	(reserved)
10.30	MCPR Canon 2 (1980)
10.31(a)	35 U.S.C. 32
10.31(b)	5 U.S.C. 501
10.31(c)	37 CFR 1.345(c) (1983)
10.32	MRPC Rule 7.2 (1983)
10.33	MRPC Rule 7.3 (1983)
10.34	MRPC Rule 7.4 (1983)
10.35(a)	5 U.S.C. 501 and MRPC Rule 7.5 (1983)
10.35(b)	MRPC Rule 7.5 (1983)
10.36	MCPR DR 2-106 (1980)
10.37	MCPR DR 2-107 (1980)
10.38	MCPR DR 2-108 (1980)
10.39	MCPR DR 2-109 (1980)
10.40	MCPR DR 2-110 (1980)
10.41 through 10.45	(reserved)
10.46	MCPR Canon 3 (1980)
10.47(a), (c)	MCPR DR 3-101 (1980)
10.47(b)	New (but see e.g., *Crawford* v. *State Bar of California*, 7 Cal. Rptr. 746, 355 P.2d 490 (Cal. 1960))
10.48	MCPR DR 3-102 (1980)
10.49	MCPR DR 3-103 (1980)
10.50 through 10.55	(reserved)
10.56	MCPR Canon 4 (1980)
10.57	MCPR DR 4-101 (1980)
10.58 through 10.60	(reserved)
10.61	MCPR Canon 5 (1980)
10.62	MCPR DR 5-101 (1980)
10.63	MCPR DR 5-102 (1980)
10.64	MCPR DR 5-103 (1980)
10.65	MCPR DR 5-104 (1980)
10.66	MCPR DR 5-105 (1980)
10.67	MCPR DR 5-106 (1980)
10.68	MCPR DR 5-107 (1980)
10.69 through 10.75	(reserved)
10.76	MCPR Canon 6 (1980)
10.77	MCPR DR 6-101 (1980)
10.78	MCPR DR 6-102 (1980)
10.79 through	

(Continued)

Table 2 (cont.)

Sec.		Sec.	
10.82	(reserved)	10.94 through 10.99	(reserved)
10.83	MCPR Canon 7 (1980)	10.100	MCPR Canon 8 (1980)
10.84	MCPR DR 7-101 (1980)	10.101(a)	MCPR DR 8-101 (1980)
10.85	MCPR DR 7-102 (1980)	10.101(b)	37 CFR 1.341(f) (1983) and 41 Op. Att'y Gen. 21 (1949), *reprinted in* 1949 Dec. Comm'r. Pat. 1
10.86	(reserved)	10.102	MCPR DR 8-102 (1980)
10.87	MCPR DR 7-104 (1980)	10.103	MCPR DR 8-103 (1980)
10.88	MCPR DR 7-105 (1980)	10.104 through 10.109	(reserved)
10.89(a) (1)-(6), (8), (9), and (b)	MCPR DR 7-106 (1980)	10.110	MCPR Canon 9 (1980)
10.89(a) (7)	*In re Williams*, 23 N.W.2d 4,9 (Minn. 1946)	10.111	MCPR DR 9-101 (1980)
10.90	(reserved)	10.112(a)	MCPR DR 9-102(A) (1980)
10.91	(reserved)	10.112(b)	MCPR DR 9-102(B) (1980)
10.92	MCPR Dr 7-109 (1980)		
10.93	VCPR DR 7-109 (1984)		

Abbreviations:
FRCP means Federal Rules of Civil Procedure
MCPR means Model Code of Professional Responsibility of the ABA (1980)
MRPC means Model Rules of Professional Conduct of the ABA (1983)
VCPR means the Virginia Code of Professional Responsibility (1984)

Table 3
Principal Source of Sections 10.130 through 10.161

Section	Source	*Reference to Proposed Rules 48 F.R. 36480 (Aug. 11, 1983)*	Section	Source	*Reference to Proposed Rules 48 F.R. 36480 *Aug. 11, 1983)*
10.130	35 U.S.C. 32	§1.360	10.139(d)	New	§1.372(b) (2)
10.131(a)	New, but see 37 CFR 1.348(a)	§1.363(a)	10.139(e)	New	New
10.131(b)	MCPR 1-103 (1980)	§1.363(b)	10.140(a)	5 USC 500(b)	§1.371
10.131(c)	New	§1.363(a)	10.140(b)	New	§1.371
10.132(a)	New	New	10.141	New	§1.366(c)
10.132(b)	New, but see 37 CFR 1.348(b) (1983)	§1.363(c)	10.142	New	§1.366(b)
10.133	New	§1.364	10.143	New	§1.370
10.134	37 CFR 1.348(b) (1983)	§1.365	10.144	New	§§1.373 and 1.374
10.135(a) (1)	New	§1.366	10.145	New	§1.369
10.135(a) (2)	37 CFR 1.348(b) (1983)	§1.366	10.146-10.149	[reserved]	
10.135(a) (3)	New	§1.366	10.150(a)	5 USC 556(d)	§1.375(a)
10.135(b)	New	New	10.150(b)	37 CFR 1.348(d) (3) (1983)	§1.375(b)
10.135(c)	New	§1.366	10.150(c)	New	§1.375(c)
10.135(d)	5 USC 500(f)	New	10.150(d)	New	§1.375(d)
10.136(a)	37 CFR 1.348(c) (1983)	§1.365(b)	10.151	37 CFR 1.348(d) (3) (1983)	§1.376
10.136(b)	New	§1.367(a)	10.152	New, see *Silverman* v. *CFTC*, 549 F.2d 28 (7th Cir. 1977)	§1.377
10.136(c)	37 CFR 1.348(c) (1983)	§1.367(b)	10.153	New, but see 5 USC 557(c)	§1.378
10.336(d)	37 CFR 1.348(c) (1983)	§1.367(c)	10.154	See 5 USC 557(b) and 35 USC 32	§1.379
10.136(e)	New	§1.367(d)	10.155	New	§1.380
10.137	37 CFR 1.348(c) (1983)	§1.368	10.156	New	§1.381
10.138	New	§1.367(e)	10.157	35 USC 32, Local Rule 1-26 (D.D.C.)	§1.381
10.139(a)	5 USC 3105	§1.372(a)	10.158	New	§1.382
10.139(b)	5 USC 556(c)	§1.372(b)	10.159	New	§1.382(d) & (e)
10.139(c)	New	§1.379	10.160	New	§1.383
			10.161	New	§1.384

Table 4
Disciplinary Proceedings in PTO (1976–1983)

Name	*Location*	*Date of Order of Suspension or Exclusion*	*Official Gazette Citation*	*Nature of Charges*
Kraft, John W.	Id.	12–16–76	954 O.G. 550 (01–11–77)	Based on suspension in Idaho
Walton, John N.	Canada	02–01–77	956 O.G. 346 (03–08–77)	Based on revocation of license to practice before the Canadian Patent Office
Paley, Lewis A.	Ill.	02–16–77	961 O.G. 48 (08–30–77)	Improper handling of patent application and making unfounded and scandalous allegations against PTO employees and judges of the U.S. Court of Appeals for the D.C. Circuit
Molasky, Joseph W.	Pa.	04–12–77	958 O.G. 12 (05–10–77)	Misconduct for attempting to remove property belonging to the PTO from the Public Search Room for Patents
Dubno, Herbert	N.Y.	05–25–77	959 O.G. 25 (06–21–77)	Misrepresenting facts to PTO in connection with applicatiion under 37 CFR §1.47
Milmore, Oswald H.	Calif.	06–22–77	962 O.G. 2 (09–06–77)	Knowingly concealing relevant prior art during prosecution of patent application. See also 196 USPQ 628 (Comm'r. Pat. 1977)
Wyden, Stephen	N.Y.	07–27–78	973 O.G. 40 (08–22–78)	Incompetently handling patent applications
Castorina, Anthony J.	Va.	08–02–78	975 O.G. 14 (10–10–78)	Based on conviction of E.D.Va. for violation of 18 U.S.C. 201(f)
Cavanagh, J. Richard	Canada	01–18–79	979 O.G. 22 (02–20–79)	Based on revocation of license to practice before Canadian Patent Office
Davis, Keith B.	Minn.	04–06–79	982 O.G. 2 (05–01–79)	Based on disbarment in Minnesota which included charges on mishandling patent matters
Hodgson, Albert C.	Va.	05–17–82	1023 O.G. 13 (10–12–82)	Based on disbarment in Va.
Pattison, William H.	Md.	08–30–82	1023 O.G. 13 (10–12–82)	Based on disbarment in Md. which included charge of mishandling patent application
Frank, William F.	Va.	08–30–82	1023 O.G. 13 (10–12–82)	Neglecting to file a response to PTO action and misrepresenting fact in request for extension of time
Dula, Arthur M., III	Tex.	04–18–83	1030 O.G. 20 (05–17–83)	Misusing certificate of mailing under 37 CFR §8. See also BNA's Patent, Copyright & Trademark Journal, Vol. 27, No. 658, p. 133 (12–08–83)

In addition to the disciplinary proceedings set out in Table 4, there have been at least eight other disciplinary proceedings since 1976 which have been terminated. One was dismissed on the merits by the Commissioner after a hearing. Three were dismissed on motion of the Solicitor after a hearing. One was dismissed after the respondent resigned while the disciplinary proceeding was pending. Three resulted in private discipline. There are three disciplinary proceedings presently pending before the PTO. The respondents in the above-mentioned eleven disciplinary proceedings are distributed geographically as follows: Calif. (1); Conn. (1); District of Columbia (1); Md. (1); N.M. (1); N.Y. (5); and Tenn. (1). Table 4 and the geographical distribution of the eleven other disciplinary proceedings which have taken place since 1976 demonstrate the nationwide nature of investigations which need to be made by the PTO.

Other Considerations: The proposed rules being considered would not have a significant impact on the quality of the human environment or the conservation of energy resources.

The proposed rules being considered are in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The Patent and Trademark Office believes that this proposed rule change being considered would not be a major rule under Executive Order 12291. The annual effect on the economy would be less than $100 million. There would be no major increase in costs or prices for consumers, individual industries, federal state, or local government agencies, or geographic regions. There would be no significant adverse effects on competition, empolyment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Parts 1, 2 and 10

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Trademarks, Lawyers.

The proposed rules being considered would make the following proposed revisions to Parts 1 and 2 and would add Part 10 as follows wherein deletions are indicated by brackets and additions by arrows:

Part 1—Rules of Practice in Patent Cases

1. Section 1.8 would be amended by adding to paragraph (a) a new subparagraph (xii) to read as follows:

§1.8 Certificate of mailing.

(a) • • •

(xii) Papers filed in connection with a disciplinary proceeding under Part 10 of this Subchapter.

* * * * *

2. Section 1.31 would be revised to read as follows:

§1.31 Applicants may be represented by [an] ►a registered◄ attorney or agent.

An applicant for patent may file and prosecute his ► or her◄ own case, or he ►or she◄ may be represented by [an] ►a registered◄ attorney ►,◄ [or] agent, ►or other individual◄ authorized to practice before the Patent and Trademark Office in patent cases. ►See §§10.6 and 10.9 of this Subchapter.◄ The Patent and Trademark Office cannot aid in the selection of [an] ►a registered◄ attorney or agent.

3. Section 1.34 would be amended by revising paragraph (a) as follows:

§1.34 Recognition for representation

(a) When a registered attorney or agent acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a patent case, his or her personal appearance or signature shall constitute a representation to the Patent and Trademark Office that under the provisions of this [part] ► Subchapter ◄ and the law, he or she is authorized to represent the particular party in whose behalf he or she acts. In filing such a paper, the ► registered ◄ attorney or agent should specify his or her registration number with his or her signature. Further proof of authority to act in a representative capacity may be required.

* * * * *

4. The center heading preceding §1.341 would be deleted.

5. Sections 1.341 through 1.348 would be deleted. Part 2--Rules of Practice in Trademark Cases

6. Section 2.11 would be revised to read as follows:

§2.11 Applicants may be represented by an attorney

The owner of a trademark may file and prosecute his ► or her ◄ own application for registration of such trademark, or he ► or she ◄ may be represented by an attorney or other [person] ► individual ◄ authorized to practice in trademark cases ► under §10.14 of this Subchapter ◄. The Patent and Trademark Office cannot aid in the selection of an attorney or other representative.

7. Sections 2.12 through 2.16 would be deleted.

8. Section 2.17 would be amended by revising paragraph (a) as follows:

§2.17 Recognition for representation

(a) When an attorney [at law] ► as defined in §10.1(c) of this Subchapter ◄ acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a trademark case, his ► or her ◄ personal appearance or signature shall constitute a representation to the Patent and Trademark Office that ►, ◄ under the provisions of [these rules] ► §10.14 ◄ and the law ►, ◄ he ► or she ◄ is authorized [, and qualified under §2.12(a)] to represent the particular party in whose behalf he ► or she ◄ acts. Further proof of authority to act in a representative capacity may be required.

* * * * *

9. Section 2.19 would be revised to read as follows:

§2.19 Revocation of power of attorney or of other authorization to represent ►, withdrawal ◄.

► (a) ◄ Authority to represent an applicant or a party to a proceeding may be revoked at any stage in the proceedings of a case upon notification to the Commissioner; and when it is so revoked, the Office will communicate directly with the applicant or party to the proceeding or with such other qualified person as may be authorized. The Patent and Trademark Office will notify the person affected of the revocation of his ► or her ◄ authorization.

► (b) An individual authorized to represent an applicant or party in a trademark case may withdraw upon application to and approval by the Commissioner. ◄

Part 10--Representation of others before the Patent and Trademark Office

10. The following Part 10 would be added:

Sec.	
10.1	Definitions
10.2	Director of Enrollment and Discipline
10.3	Committee on Enrollment
10.4	Committee on Discipline
10.5	Register of attorneys and agents in patent cases
10.6	Registration of attorneys and agents
10.7	Requirements for registration
10.8	Oath and registration fee
10.9	Limited recognition in patent cases
10.10	Individuals not registered or recognized to practice in patent cases
10.11	Removing names from the register
10.12–10.13	[reserved]
10.14	Individuals who may practice before the Office in trademark and other non-patent cases
10.15	Refusal to recognize a practitioner
10.16 –10.17	[reserved]
10.18	Signature and certificate of practitioner
10.19	[reserved]
10.20	Canons and Displinary Rules
10.21	Canon 1
10.22	Maintaining integrity and competence of the legal profession
10.23	Misconduct
10.24	Disclosure of information to authorities
10.25–10.29	[reserved]
10.30	Canon 2
10.31	Communications concerning a practitioner's services
10.32	Advertising
10.33	Direct contact with prospective clients
10.34	Communication of fields of practice
10.35	Firm names and letterheads
10.36	Fees for legal services
10.37	Division of fees among practitioners
10.38	Agreements restricting the practice of a practitioner
10.39	Acceptance of employment
10.40	Withdrawal from employment
10.41–10.45	[reserved]
10.46	Canon 3
10.47	Aiding unauthorized practice of law
10.48	Sharing legal fees
10.49	Forming a partnership with a non-practitioner
10.50–10.55	[reserved]
10.56	Canon 4
10.57	Preservation of confidences and secrets of a client
10.58–10.60	[reserved]
10.61	Canon 5
10.62	Refusing employment when the interest of the practitioner may impair the practitioner's independent professional judgment
10.63	Withdrawal when the practitioner becomes a witness
10.64	Avoiding acquisition of interest in litigation or proceeding before the Office
10.65	Limiting business relations with a client
10.66	Refusing to accept or continue employment if the interests of another client may impair the independent professional judgment of the practitioner
10.67	Settling similar claims of clients
10.68	Avoiding influence by others than the client
10.69–10.75	[reserved]
10.76	Canon 6
10.77	Failing to act competently
10.78	Limiting liability to client
10.79–10.82	[reserved]
10.83	Canon 7

10.84 Representing a client zealously
10.85 Representing a client within the bounds of the law
10.86 [reserved]
10.87 Communicating with one of adverse interest
10.88 Threatening criminal prosecution
10.89 Conduct in proceedings
10.90–10.91 [reserved]
10.92 Contact with witnesses
10.93 Contact with officials
10.94–10.99 [reserved]
10.100 Canon 8
10.101 Action as a public official
10.102 Statements concerning officials
10.103 Practitioner candidate for judicial office
10.104–
10.109 [reserved]
10.110 Canon 9
10.111 Avoiding even the appearance of impropriety
10.112 Preserving identity of funds and property of client
10.113–
10.129 [reserved]
10.130 Reprimand, suspension or exclusion
10.131 Investigations
10.132 Initiating a disciplinary proceeding; reference to an administrative law judge
10.133 Conference between Director and practitioner; resignation
10.134 Complaint
10.135 Service of complaint
10.136 Answer to complaint
10.137 Supplemental complaint
10.138 Contested case
10.139 Administrative law judge; appointment; responsibilities; review of interlocutory orders; stays
10.140 Representative for Director or respondent
10.141 Filing of papers
10.142 Service of papers
10.143 Motions
10.144 Hearings
10.145 Proof; variance; amendment of pleadings
10.146–
10.149 [reserved]
10.150 Evidence
10.151 Depositions
10.152 Discovery
10.153 Proposed findings and conclusions; post-hearing memorandum
10.154 Initial decision of administrative law judge
10.155 Appeal to the Commissioner
10.156 Decision of the Commissioner
10.157 Review of Commissioner's final decision
10.158 Suspended or excluded practitioner
10.159 Notice of suspension or exclusion
10.160 Petition for reinstatement
10.161 Savings clause

Authority: 5 U.S.C. 500, 35 U.S.C. 6, 31, 32

Part 10 -- Representation of others before the Patent and Trademark Office

§10.1 Definitions

This part governs practice of patent, trademark, and other law before the Patent and Trademark Office. Unless otherwise clear from the context, the following definitions apply to this part:

(a) "Affidavit" means affidavit, declarations under 35 U.S.C. §25 (see §1.68 and §2.20 of this Subchapter), or statutory declaration under 28 U.S.C. §1746.

(b) "Application" includes an application for a design, plant, or utility patent, an application to reissue any patent, and an application to register a trademark.

(c) "Attorney" or "lawyer" means an individual who is a member in good standing of the bar of any United States court or the highest court of any State. A "non-lawyer" is a person who is not an attorney or lawyer.

(d) "Canon" is defined in §10.20(a).

(e) "Confidence" is defined in §10.57(a).

(f) "Differing interests" include every interest that may adversely affect either the judgment or the loyalty of a practitioner to a client, whether it be a conflicting, inconsistent, diverse, or other interest.

(g) "Director" means the Director of Enrollment and Discipline.

(h) "Disciplinary Rule" is defined in §10.20(b).

(i) "Employee of a tribunal" includes all employees of courts, the Office, and other adjudicatory bodies.

(j) "Giving information" within the meaning of §10.23(c) (2) includes making (1) a written statement or representation or (2) an oral statement or representation.

(k) "Law firm" includes a professional legal corporation or a partnership.

(l) "Legal counsel" means practitioner.

(m) "Legal profession" includes the individuals who are lawfully engaged in practice of patent, trademark, and other law before the Office.

(n) "Legal service" means any legal service which may lawfully be performed by a practitioner before the Office.

(o) "Legal System" includes the Office and courts and adjudicatory bodies which review matters on which the Office has acted.

(p) "Office" means Patent and Trademark Office.

(q) "Person" includes a corporation, an association, a trust, a partnership, and any other organization or legal entity.

(r) "Practitioner" means an attorney or agent registered to practice before the Office in patent cases or an individual authorized under 5 U.S.C. §500(b), or as otherwise provided by this Subchapter, who practices before the Office in trademark cases or other non-patent cases. A "suspended or excluded practitioner" is a practitioner who is suspended or excluded under §10.156. A "non-practitioner" is an individual who is not a practitioner.

(s) A "proceeding before the Office" includes an application, a reexamination, a protest, a public use proceeding, a patent interference, an *inter partes* trademark proceeding, or any other proceeding which is pending before the Office.

(t) "Professional legal corporation" means a corporation, authorized by law to practice law for profit.

(u) "Registration" means registration to practice before the Office in patent cases.

(v) "Respondent" is defined in §10.134(a) (1).

(w) "Secret" is defined in §10.57(a).

(x) "Solicit" is defined in §10.33.

(y) "State" includes the District of Columbia, Puerto Rico, and other federal territories and possessions.

(z) "Tribunal" includes courts, the Office, and other adjudicatory bodies.

(aa) "United States" means the United States of America, its territories and possessions.

§10.2 Director of Enrollment and Discipline

(a) *Appointment.* The Commissioner shall appoint a Director of Enrollment and Discipline. In the event of the absence of the Director or a vacancy in the office of the Director, the Commissioner may designate an employee of the Office to serve as acting Director of Enrollment and Discipline.

(b) *Duties.* The Director shall:

(1) Receive and act upon applications for registration, prepare and grade the examination provided for in §10.7(b), maintain the register, and perform such other duties in connection with enrollment and recognition of attorneys and agents as may be necessary.

(2) Conduct investigations into possible violations by practitioners of Disciplinary Rules, with the consent of the Committee on Discipline initiate disciplinary proceedings under §10.132(b), and perform such other duties in connection with investigations and disciplinary proceedings as may be necessary.

(c) *Review of Director's decision.* Any final decision of the Director refusing to register an individual under §10.6, recognize an individual under §§10.9 or 10.14(c), or reinstate a suspended or excluded petitioner under §10.160, may be reviewed by petition to the Commissioner upon payment of the fee set forth in §1.___. A petition filed more than 30 days after the date of the decision of the Director may be dismissed as untimely. Any petition shall contain (1) a statement of the facts involved and the points to be reviewed and (2) the action requested. Briefs or memoranda, if any, in support of the petition shall accompany or be embodied therein. The petition will be decided on the basis of the record made before the Director and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record before the Director shall not be submitted with the petition. An oral hearing on the petition will not be granted except when considered necessary by the Commissioner. The Commissioner may delegate to appropriate Office employees the determination of a petition under this section.

§10.3 Committee on Enrollment

(a) The Commissioner may establish a Committee on Enrollment composed of one or more employees of the Office

(b) The Committee on Enrollment shall, as necessary, advise the Director in connection with the Director's duties under §10.2(b) (1).

§10.4 Committee on Discipline

(a) The Commissioner shall appoint a Committee on Discipline. The Committee on Discipline shall consist of the Director and at least two Associate Solicitors from the Office of the Solicitor.

(b) The Committee on Discipline shall meet at the request of the Director and after reviewing evidence presented by the Director shall, by majority vote and without involving in any way the Solicitor or any other professional employee on the staff of the Office of the Solicitor, determine whether there is probable cause to bring charges under §10.132 against a practitioner. When charges are brought against a practitioner:

(1) No member of the Committee on Discipline or employee under the direction of the Director shall participate in rendering a decision on the charges and

(2) The Associate Solicitors on the Committee on Discipline, or such other employee of the Office as may be designated by the Commissioner, shall act as the prosecuting attorneys in presenting any charges.

(c) No discovery shall be authorized of, and no member of the Committee on Discipline shall be required to testify about, deliberations of the Committee on Discipline.

Individuals Entitled to Practice Before the Patent and Trademark Office Office

§10.5 Register of attorneys and agents in patent cases

A register of attorneys and agents is kept in the Office on which are entered the names of all individuals recognized as entitled to represent applicants before the Office in the preparation and prosecution of applications for patent. Registration in the Office under the provisions of this part shall only entitle the individuals registered to practice before the Office in patent cases.

§10.6 Registration of attorneys and agents

(a) *Attorneys.* Any citizen of the United States who is an attorney and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office. When appropriate, any alien who is an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States and *further provided:* the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registration does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also §10.9(b).

(b) *Agents.* Any citizen of the United States who is not an attorney and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office. When appropriate, any alien who is not an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States, and *further provided:* the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registration does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also §10.9(b).

Note: All individuals registered prior to Nov. 15, 1938, were registered as attorneys, whether they were attorneys or not, and such registrations have not been changed.

(c) *Foreigners.* Any foreigner not a resident of the United States who shall file proof to the satisfaction of the Director that he or she is registered and in good standing before the patent office of the country in which he or she resides and practices and who is possessed of the qualifications stated in §10.7, may be registered as a patent agent to practice before the Office for the limited purpose of presenting and prosecuting patent applications of applicants located in such country, *provided:* the patent office of such country allows substantially reciprocal privileges to those admitted to practice before the United States Patent and Trademark Office. Registration as a patent agent under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.

(d) *Government employees.* Any officer or employee of the United States who is disqualified by statute (18 U.S.C. 203, 205) from practicing as an attorney or agent in proceedings or other matters before Government departments or agencies, may not be registered to practice before the Office. If any registered attorney or agent becomes an officer or employee of the United States who is disqualified by statute from practicing as an attorney or agent in proceedings and other matters before Government department or agencies, his or her name shall be endorsed as inactive on the register during the period of any employment by the United States. An officer or employee of the United States whose official duties require the preparation and prosecution of applications for patent and who fulfills the requirements of this part may be registered to practice before the Office to the extent necessary to carry out his or her official duties. A written statement describing the official duties of the officer or employee and signed on behalf of the agency employing the officer or employee may be required by the Director.

(e) *Former Office employees.* No individual who has served in the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written statement indicating that he or she has read 18 U.S.C. 207. No individual who has served in the patent examining corps of the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written undertaking (1) not to prosecute or aid in any manner in the prosecution of any patent application pending in any patent examining group during his or her period of service therein and (2) not to prepare or prosecute or to assist in any manner in the preparation or prosecution of any patent application of another (i) assigned to such group for examination and (ii) filed within two years after the date he or she left such group, without written

authorization of the Director. Associated and related classes in other patent examining groups may be required to be included in the undertaking or designated classes may be excluded from the undertaking. When an application for registration or reinstatement is made after resignation from the Office, the applicant will not be registered or reinstated if he or she has prepared or prosecuted or assisted in the preparation or prosecution of any any patent appliation as indicated in this paragraph.

§10.7 Requirement for registration

(a) No individual will be registered to practice before the Office unless he or she shall:

(1) apply to the Commissioner in writing on a form supplied by the Director and furnish all requested information and material and

(2) establish to the satisfaction of the Director that he or she is:

(i) of good moral character and repute;

(ii) possessed of the legal, scientific, and technical qualifications necessary to enable him or her to render applicants for patents valuable service; and

(iii) is otherwise competent to advise and assist applicants for patents in the presentation and prosecution of their applications before the Office.

(b) In order that the Director may determine whether an individual seeking to have his or her name placed upon the register has the qualifications specified in paragraph (a) of this section, satisfactory proof of good moral character and repute and of sufficient basic training in scientific and technical matters must be submitted to the Director. Except as provided in this paragraph, each applicant for registration must take and pass an examination which is held from time to time. Each application for admission to take the examination for registration must be accompanied by the fee set forth in §1.21(a) (1) of this Subchapter. The taking of an examination may be waived in the case of any individual who has actively served for at least four years in the examining corps of the Office. The examination will not be administered as a mere academic exercise.

(c) Within two months from the date an applicant is notified that he or she failed an examination, the applicant may request regrading of the examination upon payment of the fee set forth in §1. _____. Any applicant requesting regrading shall particularly point out the errors which the applicant believed occurred in the grading of his or her examination.

§10.8 Oath and registration fee

Before an individual may have his or her name entered on the register of attorneys and agents, the individual must, after his or her application is approved, subscribe and swear to an oath or make a declaration prescribed by the Commissioner and pay the registration fee set forth in §1.21(a) (2) of this Subchapter.

§10.9 Limited recognition in patent cases

(a) Any individual not registered under §10.6 may, upon a showing of circumstances which render it necessary or justifiable, be given limited recognition by the Director to prosecute as attorney or agent a specified application or specified applications, but limited recognition under this paragraph shall not extend further than the application or applications specified.

(b) When registration of an alien under paragraphs (a) or (b) of §10.6 is not appropriate, the alien may be given limited recognition as may be appropriate under paragraph (a) of this section.

§10.10 Individuals not registered or recognized to practice in patent cases

Only practitioners who are registered under §10.6 or individuals given limited recognition under §10.9 will be permitted to prosecute patent applications of others before the Office.

§10.11 Removing names from the register

(a) Registered attorneys and agents shall notify the Director of any change of address. Any notification to the Director of any change of address shall be separate from any notice of change of address filed in individual applications.

(b) A letter may be addressed to any individual on the register, at the address of which separate notice was last received by the Director, for the purpose of ascertaining whether such individual desires to remain on the register. The name of any individual failing to reply and give any information requested by the Director within a time limit specified will be removed from the register and the names of individuals so removed will be published in the *Official Gazette.* The name of any individual so removed may be reinstated on the register as may be appropriate and upon payment of the fee set forth in §1.21(a) (3) of this Subchapter.

§§10.12–10.13 [reserved]

§10.14 Individuals who may practice before the Office in trademark and other non-patent cases

(a) *Attorneys.* Any individual who is an attorney may represent others before the Office in trademark and other non-patent cases. An attorney is not required to apply for registration or recognition to practice before the Office in trademark and other non-patent cases.

(b) *Non-lawyers.* Individuals who are not attorneys are not recognized to practice before the Office in trademark and other non-patent cases, except that individuals not attorneys who were recognized to practice before the Office in trademark cases under this chapter prior to Jan. 1, 1957, will be recognized as agents to continue practice before the Office in trademark cases.

(c) *Foreigners.* Any foreigner not a resident of the United States who shall prove to the satisfaction of the Director that he or she is registered and in good standing before the patent or trademark office of the country in which he or she resides and practices, may be recognized for the limited purpose of representing applicants located in such country before the Office in the presentation and prosecution of trademark applicants, *provided*: the patent or trademark office of such country allows substantially reciprocal privileges to those permitted to practice in trademark cases before the United States Patent and Trademark Office. Recognition under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.

(d) Recognition of any individual under this section shall not be construed as sanctioning or authorizing the performance of any act regarded in the jurisdiction where performed as the unauthorized practice of law.

(e) No individual other than those specified in paragraphs (a), (b), and (c) of this section will be permitted to practice before the Office in trademark cases. Any individual may appear in a trademark or other non-patent case in his or her own behalf. Any individual may appear in a trademark, case for (1) a firm of which he or she is a member or (2) a corporation or association of which he or she is an officer and which he or she is authorized to represent, if such firm, corporation, or association is a party of a trademark proceeding pending before the Office.

§10.15 Refusal to recognize a practitioner

Any practitioner authorized to appear before the Office may be suspended or excluded in accordance with the provisions of this part. Any practitioner who is suspended or excluded under §10.156(b) or removed under§10.11(b) shall not be entitled to practice before the Office.

§§10.16–10.17 [reserved]

§10.18 Signature and certificate of practitioner

(a) Every paper filed by a practitioner representing an applicant or party to a proceeding in the Office must bear the signature of, and be personally signed by, such practitioner except those papers which are required to be signed by the applicant or party. The signature of practitioner to a paper filed by him or her, constitutes a certificate that:

(1) the paper has been read;

(2) the paper's filing is authorized;

(3) to the best of his or her knowledge, information, and belief, there is good ground to support the paper, including any allegations of improper conduct contained or alleged therein; and

(4) it is not interposed for delay.

(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See §10.23(c) (15).

§10.19 [reserved]

Patent and Trademark Office Code of Professional Responsibility

§10.20 Canons and Disciplinary Rules

(a) Canons are set out in §§10.21, 10.30, 10.46, 10.56, 10.61, 10.76, 10.83, 10.100, and 10.110. Canons are statements of axiomatic norms, expressing in general terms the standards of professional conduct expected of practitioners in their relationships with the public, with the legal system, and with the legal profession.

(b) Disciplinary Rules are set out in §10.22–10.24, 10.31–10.40, 10.47–10.57, 10.62–10.68, 10.77, 10.78, 10.84, 10.85, 10.87–10.89, 10.92, 10.93, 10.101–10.103, 10.111, and 10.112. Disciplinary Rules are mandatory in character and state the minimum level of conduct below which no practitioner can fall without being subjected to disciplinary action.

§10.21 Canon 1

A practitioner should assist in maintaining the integrity and competence of the legal profession.

§10.22 Maintaining integrity and competence of the legal profession.

(a) A practitioner is subject to discipline if the practitioner has made a materially false statement in, or if the practitioner has deliberately failed to disclose a material fact requested in connection with, the practitioner's application for registration or membership in the bar of any United States court or any State or his or her authority to otherwise practice before the Office in trademark and other non-patent cases.

(b) A practitioner shall not further the application for registration or membership in the bar of any United States court, State, or administrative agency of another person known by the practitioner to be unqualified in respect to character, education, or other relevant attribute.

§10.23 Misconduct

(a) A practitioner shall not engage in disreputable or gross misconduct.

(b) A practitioner shall not:

(1) Violate a Disciplinary Rule.

(2) Circumvent a Disciplinary Rule through actions of another.

(3) Engage in illegal conduct involving moral turpitude.

(4) Engage in conduct involving dishonesty, fraud, deceit, or misrepresentation.

(5) Engage in conduct that is prejudicial to the administration of justice.

(6) Engage in any other conduct that adversely reflects on the practitioner's fitness to practice before the Office.

(c) Conduct which constitutes a violation of paragraphs (a) and (b) of this section includes, but is not limited to:

(1) Conviction of a criminal offense involving moral turpitude, dishonesty, or breach of trust.

(2) Knowingly giving false or misleading information or knowingly participating in a material way in giving false or misleading information, to:

(i) A client in connection with any immediate, prospective, or pending business before the Office.

(ii) The Office or any employee of the Office.

(3) Misappropriation of, or failure to properly or timely remit, funds received by a practitioner or the practitioner's firm from a client to pay a fee which the client is required by law to pay to the Office.

(4) Directly or indirectly improperly influencing, attempting to improperly influence, offering or agreeing to improperly influence, or attempting to offer or agree to improperly influence an official action of any employee of the Office by:

(i) use of threats, false accusations, duress, or coercion,

(ii) an offer of any special inducement or promise of advantage, or

(iii) bestowing of any gift, favor, or thing of value.

(5) Suspension or disbarment from practice as an attorney or agent by any duly constituted authority of a State or the United States or, in the case of a practitioner who resides in a foreign country or is registered under§10.6(c), suspension or disbarment as an attorney or agent by any duly constituted authority of:

(i) a State,

(ii) the United States, or

(iii) the country in which the practitioner resides.

(6) Knowingly aiding or abetting a practitioner, suspended or excluded from practice before the Office in engaging in unauthorized practice before the Office under §10.158.

(7) Knowingly withholding from the Office information identifying a patent or application of another from which one or more claims have been copied.

(8) Failing to forward, or failing to notify the Office of an inability to forward, to a client correspondence received from the Office or the client's opponent in an *inter partes* proceeding before the Office which could have a significant effect on a matter pending before the Office and received by a practitioner on behalf of a client or former client when:

(i) responsibility of the practitioner for the pending matter has not been terminated pursuant to §§1.36 or 2.19 of the Subchapter or

(ii) the practitioner has not been authorized to withdraw pursuant to §§1.36 or 2.19, of this Subchapter. See §§10.40, 10.63, and 10.66.

(9) Knowingly misusing a certificate of mailing under §1.8 of this Subchapter or a certificate of "Express Mail" under §1.10 of this Subchapter.

(10) Violating the duty of candor or good faith requirements of §1.56(a) of this Subchapter.

(11) Knowingly filing, or causing to be filed, an application which is subject to being stricken under §1.56(c) of this Subchapter.

(12) In the absence of information sufficient to establish a reasonable belief in the existence of probable cause that a practitioner is in violation of, or has violated, a Disciplinary Rule, causing a disciplinary investigation to be made, or a disciplinary proceeding to be brought, against the practitioner by a court, a state, or an administrative agency.

(13) Knowingly preparing or prosecuting a patent application in violation of an undertaking signed under §10.6(e).

(14) Knowingly failing to advise the Director in writing of any change which would preclude continued registration under §10.6.

(15) Knowingly signing a paper filed in the Office in violation of the provisions of §10.18 or including scandalous or indecent matter in a paper filed in the Office.

(16) Willfully refusing to reveal or report knowledge or evidence to the Director contrary to §10.24 or paragraph (b) of §10.131.

(17) Representing before the Office in a patent case either a joint venture comprising an inventor and invention developer or an inventor referred to the registered practitioner by an invention developer when (i) the registered practitioner knows, or should have reasonably known, that a formal complaint filed by a federal or state agency, based on any violation of any law relating to securities, unfair methods of competition, unfair or deceptive acts or practices, mail fraud, or other civil or criminal conduct, is pending before a federal or state court or federal or state agency, or has been resolved unfavorably by such court or agency, against the invention developer in connection with invention development services and (ii) the registered practitioner fails to fully advise the inventor of the existence of the pending

complaint or unfavorable resolution thereof prior to undertaking or continuing representation of the join venture or inventor. "Invention developer" means any person, and any agent, employee, officer, partner, or independent contractor thereof, who is not a registered practitioner and who advertises invention development services in media of general circulation or who enters into contracts for invention development services with customers as a result of such advertisement. "Invention development services" means acts of invention development required or promised to be performed, or actually performed, or both, by an invention developer for a customer. "Invention development" means the evaluation, perfection, marketing, brokering, or promotion of an invention on behalf of a customer by an invention developer, including a patent search, preparation of a patent application, or any other act done by an invention developer for consideration toward the end of procuring or attempting to procure a license, buyer, or patent for an invention. "Customer" means any individual who has made an invention and who enters into a contract for invention development services with an invention developer with respect to the invention by which the inventor becomes obligated to pay the invention developer less than $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention). "Contract for invention development services" means a contract for invention development services with an invention developer with respect to an invention made by a customer by which the inventor becomes obligated to pay the invention developer less than $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention).

(18) In the absence of information sufficient to establish a resonable belief that fraud or inequitable conduct has occurred, alleging before a tribunal that anyone has committed a fraud on the Office or engaged in inequitable conduct in a proceeding before the Office.

(d) A practitioner who acts with reckless indifference to whether a representation is true or false is chargeable with knowledge of its falsity. Deceitful statements or half-truths or concealment of material facts shall be deemed actual fraud within the meaning of this part.

§10.24 Disclosure of information to authorities

(a) A practitioner possessing unprivileged knowledge of a violation of a Disciplinary Rule shall report such knowledge to the Director.

(b) A practitioner possessing unprivileged knowledge or evidence concerning another practitioner, employee of the Office, or a judge shall reveal fully such knowledge or evidence upon proper request of a tribunal or other authority empowered to investigate or act upon the conduct of practitioners, employees of the Office, or judges.

§10.30 Canon 2

A practitioner should assist the legal profession in fulfilling its duty to make legal counsel available.

§10.31 Communications concerning a practitioner's services.

(a) No practitioner shall with respect to any prospective business before the Office, by word, circular, letter, or advertising, with intent to defraud in any manner, deceive, mislead, or threaten any prospective applicant or other person having immediate or prospective business before the Office.

(b) A practitioner may not use the name of a Member of either House of Congress or of an individual in the service of the United States in advertising the practitioner's practice before the Office.

(c) Unless a practitioner is an attorney, the practitioner shall not hold himself or herself out to be an attorney or lawyer or as authorized to practice before the Office in trademark and other non-patent cases.

§10.32 Advertising

(a) Subject to §10.31, a practitioner may advertise services through public media, including a telephone directory, legal directory, newspaper, or other periodical, radio, or television, or through written communications not involving solicitation as defined by §10.33.

(b) A copy or recording of an advertisement or written communication shall be kept for two years after its last dissemination along with a record of when and where it was used. Upon a written request by the Director, a practitioner shall make the copy or recording available to the Director.

(c) A practitioner shall not give anything of value to a person for recommending the practitioner's services, except that a practitioner may pay the reasonable cost of advertising or written communication permitted by this section and may pay the usual charges of a not-for-profit lawyer referral service or other legal service organization.

(d) Any communication made pursuant to this section shall include the name of at least one practitioner responsible for its content.

§10.33 Direct contract with prospective clients

A practitioner may not solicit professional employment from a prospective client with whom the practitioner has no family or prior professional relationship, by mail, in-person or otherwise, when a significant motive for the practitioner's doing so is the practitioner's pecuniary gain under circumstances evidencing undue influence, intimidation, or overreaching. The term "solicit" includes contact in person, by telephone or telegraph, by letter or other writing, or by other communication directed to a specific recipient, but does not include letters addressed or advertising circulars distributed generally to persons not specifically known to need legal services of the kind provided by the practitioner in a particular matter, but who are so situated that they might in general find such services useful.

§10.34 Communication of fields of practice

A registered practitioner may state or imply that the practitioner is a specialist as follows:

(a) A registered practitioner who is an attorney may use the designation "Patents," "Patent Attorney," "Patent Lawyer," "Registered Patent Attorney," or a substantially similar designation.

(b) A registered practitioner who is not an attorney may use the designation "Patents," "Patent Agent," "Registered Patent Agent," or a substantially similar designation.

§10.35 Firm names and letterheads

(a) A practitioner shall not use a firm name, letterhead, or other professional designation that violates §10.31. A trade name may be used by a practitioner in private practice if it does not imply a current connection with a government agency or with a public or charitable legal services organization and is not otherwise in violation of §10.31.

(b) Practitioners may state or imply that they practice in a partnership or other organization only when that is the fact.

§10.36 Fees for legal services

(a) A practitioner shall not enter into an agreement for, charge, or collect an illegal or clearly excessive fee.

(b) A fee is clearly excessive when, after a review of the facts, a practitioner of ordinary prudence would be left with a definite and firm conviction that the fee is in excess of a reasonable fee. Factors to be considered as guides in determining the reasonableness of a fee include the following:

(1) The time and labor required, the novelty and difficulty of the questions involved, and the skill requisite to perform the legal service properly.

(2) The likelihood, if apparent to the client, that the acceptance of the particular employment will preclude other employment by the practitioner.

(3) The fee customarily charged in the locality for similar legal services.

(4) The amount involved and the results obtained.

(5) The time limitations imposed by the client or by

the circumstances.

(6) The nature and length of the professional relationship with the client.

(7) The experience, reputation, and ability of the practitioner or practitioners performing the services.

(8) Whether the fee is fixed or contingent.

§10.37 Division of fees among practitioners

(a) A practitioner shall not divide a fee for legal services with another practitioner who is not a partner in or associate of the practitioner's law firm or law office, unless:

(1) The client consents to employment of the other practitioner after a full disclosure that a division of fees will be made.

(2) The division is made in proportion to the services performed and responsibility assumed by each.

(3) The total fee of the practitioners does not clearly exceed reasonable compensation for all legal services rendered to the client.

(b) This section does not prohibit payment to a former partner or associate pursuant to a separation or retirement agreement.

§10.38 Agreements restricting the practice of a practitioner

(a) A practitioner shall not be a party to or participate in a partnership or employment agreement with another practitioner that restricts the right of a practitioner to practice before the Office after the termination of a relationship created by the agreement, except as a condition to payment of retirement benefits.

(b) In connection with the settlement of a controversy or suit, a practitioner shall not enter into an agreement that restricts the practitioner's right to practice before the Office.

§10.39 Acceptance of employment

A practitioner shall not accept employment on behalf of a person if the practitioner knows or it is obvious that such person whishes to:

(a) Bring a legal action or commence a proceeding before the Office, or conduct a defense, or assert a position in litigation or any proceeding pending before the Office, or otherwise have steps taken for the person, merely for the purpose of harassing or maliciously injuring any other person.

(b) Present a claim or defense in litigation or any proceeding before the Office that is not warranted under existing law, unless it can be supported by good faith argument for an extension, modification, or reversal of existing law.

§10.40 Withdrawal from employment

(a) A practitioner shall not withdraw from employment in a proceeding before the Office without permission from the Office (see §§1.36, and 2.19 of this Subchapter). In any event, a practitioner shall not withdraw from employment until the practitioner has taken reasonable steps to avoid foreseeable prejudice to the rights of the client, including giving due notice to another practitioner, delivering to the client all papers and property to which the client is entitled, and complying with applicable laws and rules. A practitioner who withdraws from employment shall refund promptly any part of a fee paid in advance that has not been earned.

(b) *Mandatory withdrawal.* A practitioner representing a client before the Office shall withdraw from employment if:

(1) the practitioner knows or it is obvious that the client is bringing a legal action, commencing a proceeding before the Office, conducting a defense, or asserting a position in litigation or any proceeding pending before the Office, or is otherwise having steps taken for the client, merely for the purpose of harassing or maliciously injuring any person;

(2) the practitioner knows or it is obvious that the practitioner's continued employment will result in violation of a Disciplinary Rule;

(3) the practitioner's mental or physical condition renders it unreasonably difficult for the practitioner to carry out the employment effectively; or

(4) the practitioner is discharged by the client.

(c) *Permissive withdrawal.* If paragraph (b) of this section is not applicable, a practitioner may not request permission to withdraw in matters pending before the Office, and may not withdraw in other matters, unless such request or such withdrawal is because:

(1) the petitioner's client:

(i) insists upon presenting a claim or defense that is not warranted under existing law and cannot be supported by good faith argument for an extension, modification, or reversal of existing law;

(ii) personally seeks to pursue an illegal course of conduct;

(iii) insists that the practitioner pursue a course of conduct that is illegal or that is prohibited under a Disciplinary Rule.

(iv) by other conduct renders it unreasonably difficult for the practitioner to carry out the employment effectively;

(v) insists, in a matter not pending before a tribunal, that the practitioner engage in conduct that is contrary to the judgment and advice of the practitioner but not prohibited under the Disciplinary Rule; or

(vi) deliberately disregards an agreement or obligation to the practitioner as to expenses or fees;

(2) the practitioner's continued employment is likely to result in a violation of a Disciplinary Rule;

(3) the practitioner's inability to work with co-counsel indicates that the best interests of the client likely will be served by withdrawal;

(4) the practitioner's mental or physical condition renders it difficult for the practitioner to carry out the employment effectively;

(5) the practitioner's client knowingly and freely assents to termination of the employment; or

(6) the practitioner believes in good faith, in a proceeding pending before the Office, that the Office will find the existence of other good cause for withdrawal.

§10.46 Canon 3

A practitioner should assist in preventing the unauthorized practice of law.

§10.47 Aiding unauthorized practice of law

(a) A practitioner shall not aid a non-practitioner in the unauthorized practice of law before the Office.

(b) A practitioner shall not aid a suspended or excluded practitioner in the practice of law before the Office.

(c) A practitioner shall not aid a non-lawyer in the unauthorized practice of law.

§10.48 Sharing legal fees

(a) A practitioner or a firm of practitioners shall not share legal fees with a non-practitioner except that:

(1) An agreement by a practitioner with the practitioner's firm, partner, or associate may provide for the payment of money, over a reasonable period of time after the practitioner's death, to the practitioner's estate or to one or more specified persons.

(2) A practitioner who undertakes to complete unfinished legal business of a deceased practitioner may pay to the estate of the deceased practitioner that proportion of the total compensation which fairly represents the services rendered by the deceased practitioner.

(3) A practitioner or firm of practitioner's may include non-practitioner employees in a compensation or retirement plan, even though the plan is based in whole or in part on a profit-sharing arrangement, providing such plan does not circumvent another Disciplinary Rule.

§10.49 Forming a partnership with a non-practitioner

A practitioner shall not form a partnership with a non-practitioner if any of the activities of the partnership consist of the practice of patent, trademark, or other law before the Office.

§10.56 Canon 4

A practitioner should preserve the confidences and secrets of a client.

§10.57 Preservation of confidences and secrets of a client

(a) "Confidence" refers to information protected by the attorney-client or agent-client privilege under applicable law. "Secret" refers to other information gained in the professional relationship that the client has requested be held inviolate or the disclosure of which would be embarrassing or would be likely to be detrimental to the client.

(b) Except when permitted under paragraph (c) of this section, a practitioner shall not knowingly:

(1) Reveal a confidence or secret of a client.

(2) Use a confidence or secret of a client to the disadvantage of the client.

(3) Use a confidence or secret of a client for the advantage of the practitioner or of a third person, unless the client consents after full disclosure.

(c) A practitioner may reveal:

(1) Confidences or secrets with the consent of the client affected but only after a full disclosure to the client.

(2) Confidences or secrets when permitted under Disciplinary Rules or required by law or court order.

(3) The intention of a client to commit a crime and the information necessary to prevent the crime.

(4) Confidences or secrets necessary to establish or collect the practitioner's fee or to defend the practitioner or the practitioner's employees or associates against an accusation of wrongful conduct.

(d) A practitioner shall exercise reasonable care to prevent the practitioner's employees, associates, and others whose services are utilized by the practitioner from disclosing or using confidences or secrets of a client, except that a practitioner may reveal the information allowed by paragraph (c) of this section through an employee.

§10.61 Canon 5

A practitioner should exercise independent professional judgment on behalf of a client.

§10.62 Refusing employment when the interest of the practitioner may impair the practitioner's independent professional judgment.

(a) Except with the consent of a client after full disclosure, a practitioner shall not accept employment if the exercise of the practitioner's professional judgment on behalf of the client will be or reasonably may be affected by the practitioner's own financial, business, property, or personal interests.

(b) A practitioner shall not accept employment in contemplated or pending litigation or a proceeding in the Office if the practitioner knows or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness, except that the practitioner may undertake the employment and the practitioner or another practitioner in the practitioner's firm may testify:

(1) If the testimony will relate solely to an uncontested matter.

(2) If the testimony will relate solely to a matter of formality and there is no reason to believe that substantial evidence will be offered in opposition to the testimony.

(3) If the testimony will relate solely to the nature and value of legal services rendered in the case by the practitioner or the practitioner's firm to the client.

(4) As to any matter, if refusal would work a substantial hardship on the client because of the distinctive value of the practitioner or the practitioner's firm as counsel in the particular case.

§10.63 Withdrawal the practitioner becomes a witness

(a) If, after undertaking employment in contemplated or pending litigation or a proceeding in the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness on behalf of a practitioner's client, the practitioner shall withdraw from the conduct of the trial or proceeding and the practitioner's firm, if any, shall not continue representation in the trial or proceeding, except that the practitioner may continue the representation and the practitioner or another practitioner in the practitioner's firm may testify in the circumstances enumerated inparagraphs (1) through (4) of §10.62(b).

(b) If, after undertaking employment in contemplated or pending litigation or a proceeding in the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm may be asked to sign an affidavit to be filed in the Office or be called as a witness other than on behalf of the practitioner's client, the practitioner may continue the representation until it is apparent that the practitioner's affidavit or testimony is or may be prejudicial to the practitioner's client.

§10.64 Avoiding acquisition of interest in litigation or proceeding before the Office.

(a) A practitioner shall not acquire a proprietary interest in the subject matter of a proceeding before the Office which the practitioner is conducting for a client, except that the practitioner may:

(1) Acquire a lien granted by law to secure the practitioner's fee or expenses.

(2) Contract with a client for a reasonable contingent fee.

(b) While representing a client in connection with a contemplated or pending proceeding before the Office, a practitioner shall not advance or guarantee financial assistance to a client, except that a practitioner may advance or guarantee the expenses of going forward in a proceeding before the Office including fees required by law to be paid to the Office, expenses of investigation, expenses of medical examination, and costs of obtaining and presenting evidence, provided the client remains ultimately liable for such expenses.

§10.65 Limiting business relations with a client

(a) A practitioner shall not enter into a business transaction with a client if they have differing interests therein and if the client expects the practitioner to exercise professional judgment therein for the protection of the client, unless the client has consented after full disclosure.

(b) Prior to conclusion of all aspects of the matter giving rise to a practitioner's employment, a practitioner shall not enter into any arrangement or understanding with a client or a prospective client by which the practitioner acquires an interest in publication rights with respect to the subject matter of the practitioner's employment or proposed employment.

§10.66 Refusing to accept or continue employment if the interests of another client may impair the independent professional judgment of the practitioner

(a) A practitioner shall decline proffered employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the acceptance of the proffered employment, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.

(b) A practitioner shall not continue multiple employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the practitioner's representation of another client, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.

(c) In the situations covered by paragraphs (a) and (b) of this section a practitioner may represent multiple clients if it is obvious that the practitioner can adequately represent the interest of each and if each consents to the representation after full disclosure of the possible effect of such representation on the exercise of the practitioner's independent professional judgment on behalf of each.

(d) If a practitioner is required to decline employment or to withdraw from employment under a Disci-

plinary Rule, no partner, or associate, or any other practitioner affiliated with the practitioner or the practitioner's firm, may accept or continue such employment unless otherwise ordered by the Director or Commissioner.

§10.67 Settling similar claims of clients

A practitioner who represents two or more clients shall not make or participate in the making of an aggregate settlement of the claims of or against the practitioner's clients, unless each client has consented to the settlement after being advised of the existence and nature of all the claims involved in the proposed settlement, of the total amount of the settlement, and of the participation of each person in the settlement.

§10.68 Avoiding influence by others than the client

(a) Except with the consent of the practitioner's client after full disclosure, a practitioner shall not:

(1) Accept compensation from one other than the practitioner's client for the practitioner's legal services to or for the client.

(2) Accept from one other than the practitioner's client any thing of value related to the practitioner's representation of or the practitioner's employment by the client.

(b) A practitioner shall not permit a person who recommends, employs, or pays the practitioner to render legal services for another to direct or regulate the practitioner's professional judgment in rendering such legal services.

(c) a practitioner shall not practice with or in the form of a professional corporation or association authorized to practice law for a profit, if:

(1) A non-practitioner owns any interest therein, except that a fiduciary representative of the estate of a practitioner may hold the stock or interest of the practitioner for a reasonable time during administration;

(2) A non-practitioner is a corporate director or officer thereof; or

(3) A non-practitioner has the right to direct or control the professional judgment of a practitioner.

§10.76 Canon 6

A practitioner should represent a client competently

§10.77 Failing to act competently

A practitioner shall not:

(a) Handle a legal matter which the practitioner knows or should know that the practitioner is not competent to handle, without associating with the practitioner another practitioner who is competent to handle it.

(b) Handle a legal matter without preparation adequate in the circumstances.

(c) Neglect a legal matter entrusted to the practitioner.

§10.78 Limiting liability to client

A practitioner shall not attempt to exonerate himself or herself from, or limit his or her liability to, a client for his or her personal malpractice.

§10.83 Canon 7

A practitioner should represent a client zealously within the bounds of the law.

§10.84 Representing a client zealously

(a) A practitioner shall not intentionally:

(1) Fail to seek the lawful objectives of a client through reasonably available means permitted by law and the Disciplinary Rules, except as provided by paragraph (b) of this section. A practitioner does not violate the provisions of this section, however, by acceding to reasonable requests of opposing counsel which do not prejudice the rights of the client, by being punctual in fulfilling all professional commitments, by avoiding offensive tactics, or by treating with courtesy and consideration all persons involved in the legal process.

(2) Fail to carry out a contract of employment entered into with a client for professional services, but a practitioner may withdraw as permitted under §§10.40, 10.63, and 10.66.

(3) Prejudice or damage a client during the course of a professional relationship, except as required under §10.85.

(b) In representation of a client, a practitioner may:

(1) Where permissible, exercise professional judgment to waive or fail to assert a right or position of the client.

(2) Refuse to aid or participate in conduct that the practitioner believes to be unlawful, even through there is some support for an argument that the conduct is legal.

§10.85 Representing a client within the bounds of the law

(a) In representation of a client, a practitioner shall not:

(1) Initiate or defend any proceeding in the Office, assert a position, conduct a defense, delay a trial or proceeding in the Office, or take other action on behalf of the practitioner's client when the practitioner knows or when it is obvious that such action would serve merely to harass or maliciously injure another.

(2) Knowingly advance a claim or defense that is unwarranted under existing law, except that a practitioner may advance such claim or defense if it can be supported by good faith argument for an extension, modification, or reversal of existing law.

(3) Conceal or knowingly fail to disclose that which the practitioner is required by law to reveal.

(4) Knowingly use perjured testimony or false evidence.

(5) Knowingly make a false statement of law or fact.

(6) Participate in the creation or preservation of evidence when the practitioner knows or it is obvious that the evidence is false.

(7) Destroy a document or other material that the practitioner knows or should know is relevant to a pending proceeding in the Office or a proceeding in the Office that is reasonably foreseeable or counsel, advise, or assist another person to do so.

(8) Counsel or assist a client in conduct that the practitioner knows to be illegal or fraudulent.

(9) Knowingly engage in other illegal conduct or conduct contrary to a Disciplinary Rule.

(b) A practitioner who receives information clearly establishing that:

(1) A client has, in the course of the representation, perpetrated a fraud upon a person or tribunal shall promptly call upon the client to rectify the same, and if the client refuses or is unable to do so the practitioner shall reveal the fraud to the affected person or tribunal, except when the information is protected as a privileged communication.

(2) A person other than a client has perpetrated a fraud upon a tribunal shall promptly reveal the fraud to the tribunal.

§10.87 Communicating with one of adverse interest

During the course of representation of a client, a practitioner shall not:

(a) Communicate or cause another to communicate on the subject of the representation with a party the practitioner knows to be represented by another practitioner in that matter unless the practitioner has the prior consent of the other practitioner representing such other party or is authorized by law to do so.

(b) Give advice to a person who is not represented by a practitioner other than the advice to secure counsel, if the interests of such person are or have a reasonable possibility of being in conflict with the interests of the practitioner's client.

10.88 Threatening criminal prosecution

A practitioner shall not present, participate in presenting, or threaten to present criminal charges solely to obtain an advantage in any prospective or pending proceeding before the Office.

§10.89 Conduct in proceedings

(a) A practitioner shall not disregard or advise a client to disregard any provision of this Subchapter or a decision of the Office made in the course of a proceeding before the Office, but the practitioner may take appro-

priate steps in good faith to test the validity of such provision or decision.

(b) In presenting a matter to the Office, a practitioner shall disclose:

(1) Legal authority known to the practitioner to be directly adverse to the position of the client and which is not disclosed by opposing counsel or an employee of the Office.

(2) Unless privileged or irrelevant, the identities of the client the practitioner represents and of the persons who employed the practitioner.

(c) In appearing in a professional capacity before a tribunal, a practitioner shall not:

(1) State or allude to any matter that the practitioner has no reasonable basis to believe is relevant to the case or that will not be supported by admissible evidence.

(2) Ask any question that the practitioner has no reasonable basis to believe is relevant to the case and that is intended to degrade a witness or other person.

(3) Assert the practitioner's personal knowledge of the facts in issue, except when testifying as a witness.

(4) Assert the practitioner's personal opinion as to the justness of a cause, as to the credibility of a witness, as to the culpability of a civil litigant, or as to the guilt or innocence of an accused; but the practitioner may argue, on the practitioner's analysis of the evidence, for any position or conclusion with respect to the matters stated herein.

(5) Fail to comply with known customs or courtesy or practice of the Office without giving to opposing counsel timely notice of the practitioner's intent not to comply.

(6) Engage in undignified or discourteous conduct which is degrading to a tribunal.

(7) Intentionally or habitually violate any provision of this Subchapter or established rule of evidence.

§10.92 Contact with witnesses

(a) A practitioner shall not suppress any evidence that the practitioner or the practitioner's client has a legal obligation to reveal or produce.

(b) A practitioner shall not advise or cause a person to be secreted or to leave the jurisdiction of a tribunal for the purpose of making the person unavailable as a witness therein.

(c) A practitioner shall not pay, offer to pay, or acquiesce in the payment of compensation to a witness contingent upon the content of the witness' affidavit, testimony or the outcome of the case. But a practitioner may advance, guarantee, or acquiesce in the payment of:

(1) Expenses reasonably incurred by a witness in attending, testifying, or making an affidavit.

(2) Reasonable compensation to a witness for the witness' loss of time in attending, testifying, or making an affidavit.

(3) A reasonable fee for the professional services of an expert witness.

§10.93 Contact with officials

(a) A practitioner shall not give or lend anything of value to a judge, official, or employee of a tribunal under circumstance which might give the appearance that the gift or loan is made to influence official action.

(b) In an adversary proceeding, including any *inter partes* proceeding in the Office, a practitioner shall not communicate, or cause another to communicate, as to the merits of the cause with a judge, official, or Office employee before whom the proceeding is pending, except:

(1) In the course of official proceedings in the cause.

(2) In writing if the practitioner promptly delivers a copy of the writing to opposing counsel or to the adverse party if practitioner is not represented by a practitioner.

(3) Orally upon adequate notice to opposing counsel or to the adverse party if the adverse party is not represented by a practitioner.

(4) As otherwise authorized by law.

§10.100 Canon 8

A practitioner should assist in improving the legal system.

§10.101 Action as a public official

(a) A practitioner who holds public office shall not:

(1) Use the practitioner's public position to obtain, or attempt to obtain, a special advantage in legislative matters for the practitioner or for a client under circumstances where the practitioner knows or it is obvious that such action is not in the public interest.

(2) Use the practitioner's public position to influence, or attempt to influence, a tribunal to act in favor of the practitioner or of a client.

(3) Accept any thing of value from any person when the practitioner knows or it is obvious that the offer is for the purpose of influencing the practitioner's action as a public official.

(b) A practitioner who is an officer or employee of the United States shall not practice before the Office in patent cases except as provided in §10.6(d).

§10.102 Statements concerning officials

(a) A practitioner shall not knowingly make false statements of fact concerning the qualifications of a candidate for election or appointment to a judicial office or to a position in the Office.

(b) A practitioner shall not knowingly make false accusations against a judge, other adjudicatory officer, or employee of the Office.

§10.103 Practitioner candidate for judicial office

A practitioner who is a candidate for judicial office shall comply with applicable provisions of law.

10.110 Canon 9

A practitioner should avoid even the appearance of professional impropriety.

§10.111 Avoiding even the appearance of impropriety

(a) A practitioner shall not accept private employment in a matter upon the merits of which he or she has acted in a judicial capacity.

(b) A practitioner shall not accept private employment in a matter in which he or she had personal responsibility while a public employee.

(c) A practitioner shall not state or imply that the practitioner is able to influence improperly or upon irrelevant grounds any tribunal, legislative body, or public official.

§10.112 Preserving identity of funds and property of client

(a) All funds of clients paid to a practitioner or a practitioner's firm, other than advances for costs and expenses, shall be deposited in one or more identifiable bank accounts maintained:

(1) in the case of a practitioner whose office is located in the United States, in the State in which the practitioner's office is situated or

(2) in the case of a practitioner having an office in a foreign country or registered under §10.6(c) in the United States or the foreign country.

(b) No funds belonging to the practitioner or the practitioner's firm shall be deposited in the bank accounts required by paragraph (a) of this section except as follows:

(1) Funds reasonably sufficient to pay bank charges may be deposited therein.

(2) Funds belonging in part to a client and in part presently or potentially to the practitioner or the practitioner's firm must be deposited therein, but the portion belonging to the practitioner or the practitioner's firm may be withdrawn when due unless the right of the practitioner or the practitioner's firm to receive it is disputed by the client, in which event the disputed portion shall not be withdrawn until the dispute is finally resolved.

(c) A practitioner shall:

(1) Promptly notify a client of the receipt of the client's funds, securities, or other properties.

(2) Identify and label securities and properties of a cli-

ent promptly upon receipt and place them in a safe deposit box or other place of safekeeping as soon as practicable.

(3) Maintain complete records of all funds, securities, and other properties of a client coming into the possession of the practitioner and render appropriate accounts to the client regarding the funds, securities, or other properties.

(4) Promptly pay or deliver to the client as requested by a client the funds, securities, or other properties in the possession of the practitioner which the client is entitled to receive.

Disciplinary Proceedings

§10.130 Reprimand, suspension or exclusion

(a) The Commissioner may, after notice and opportunity for a hearing, (a) reprimand or (b) suspend or exclude, either generally or in any particular case, any individual, attorney, or agent shown to be incompetent or disreputable, who is guilty of gross misconduct, or who violates a Disciplinary Rule.

(b) Petitions to disqualify a practitioner in *ex parte* or *inter partes* cases in the Office are not governed by §§10.130 through 10.161 and will be handled on a case-by-case basis under such conditions as the Commissioner deems appropriate.

§10.131 Investigations

(a) The Director is authorized to investigate possible violations of Disciplinary Rules by practitioners. See §10.2(b) (2). The investigation shall be such as to determine whether there is probable cause to believe that a violation of a Disciplinary Rule by a practitioner has occurred.

(b) Practitioners shall report and reveal to the Director any knowledge or evidence required by §10.24. A practitioner shall cooperate with the Director in connection with any investigation under paragraph (a) of this section and with officials of the Office in connection with any disciplinary proceeding instituted under §10.132(b).

(c) Any non-practitioner possessing knowledge or information concerning a violation of a Disciplinary Rule by a practitioner may report the violation to the Director. The Director may require that report be presented in the form of an affidavit.

§10.132 Initiating a disciplinary proceeding; reference to an administrative law judge

(a) If after conducting an investigation under §10.131(a) the Director is of the opinion that there is probable cause to believe that a practitioner has violated a Disciplinary Rule, the Director shall, after complying where necessary with the provisions of 5 U.S.C. 558(c), call a meeting of the Committee on Discipline. The Committee on Discipline shall then determine as specified in §10.4(b) whether a disciplinary proceeding shall be instituted under paragraph (b) of this section.

(b) If the Committee on Discipline determines that probable cause exists to believe that a practitioner has violated a Disciplinary Rule, the Director shall institute a disciplinary proceeding by filing a complaint under §10.134. The complaint shall be filed in the Office of the Director. A disciplinary proceeding may result in:

(1) a reprimand or

(2) suspension or exclusion of a practitioner from practice before the Office.

(c) Upon the filing of a complaint under §10.134, the Commissioner will refer the disciplinary proceeding to an administrative law judge.

§10.133 Conference between Director and practitioner; resignation

(a) *General.* The Director may confer with a practitioner concerning possible violations by the practitioner of a Disciplinary Rule whether or not a disciplinary proceeding has been instituted.

(b) *Resignation.* A practitioner may avoid institution or conclusion of a disciplinary proceeding by resigning from practice before the Office. Any practitioner who resigns from practice before the Office after a complaint has been filed under §10.134 and who thereafter applies for reinstatement must comply with the provisions of §10.158.

(c) *Settlement.* Before or after a complaint is filed under§10.134, a settlement conference may occur between the Director and a practitioner for the purpose of settling any disciplinary matter. If an offer of settlement is made by the Director or the practitioner and is not accepted by the other, no reference to the offer of settlement or its refusal shall be admissible in evidence in the disciplinary proceeding unless both the Director and the practitioner agree in writing.

§10.134 Complaint

(a) A complaint instituting a disciplinary proceeding shall:

(1) Name the practitioner, who may then be referred to as the "respondent."

(2) Give a plain and concise description of the violations of the Disciplinary Rules by the practitioner.

(3) State the place and time for filing an answer by the respondent.

(4) State that a decision by default may be entered against the respondent if an answer is not timely filed.

(5) Be signed by the Director.

(b) A complaint will be deemed sufficient if it fairly informs the respondent of any violation of the Disciplinary Rules which form the basis for the disciplinary proceeding so that the respondent is able to adequately prepare a defense.

§10.135 Service of complaint

(a) A complaint may be served on a respondent in any of the following methods:

(1) By handing a copy of the complaint personally to the respondent, in which case the individual handing the complaint to the respondent shall file an affidavit with the Director indicating the time and place the complaint was handed to the respondent.

(2) By mailing a copy of the complaint by "Express Mail" or first-class mail to:

(i) a registered practitioner at the address for which separate notice was last received by the Committee on Enrollment or

(ii) a non-registered practitioner at the last address for the respondent known to the Director.

(3) By any method mutually agreeable to the Director and the respondent.

(b) If a complaint served by mail under paragraph (a) (2) of this section is returned by the U.S. Postal Service, the Director shall mail a second copy of the complaint to the respondent. If the second copy of the complaint is also returned by the U.S. Postal Service, the Director shall serve the respondent by publishing an appropriate notice in the *Official Gazette* for four consecutive weeks, in which case the time for answer shall be at least thirty days from the fourth publication of the notice.

(c) If a respondent is a registered practitioner, the Director may serve simultaneously with the complaint a letter under §10.11(b). The Director may require the respondent to answer the §10.11(b) letter within a period not less than 15 days. An answer to the §10.11(b) letter shall constitute proof of service. If the respondent fails to answer the §10.11(b) letter, his or her name will be removed from the register as provided by §10.11(b).

(d) If the respondent is represented by an attorney under§10.140(a), a copy of the complaint shall also be served on the attorney.

§10.136 Answer to complaint

(a) *Time for answer.* An answer to a complaint shall be filed within a time set in the complaint which shall be not less than thirty days.

(b) *With whom filed.* The answer shall be filed in writing with the administrative law judge. The time for filing an answer may be extended once for a period of no more than thirty days by the administrative law judge upon a showing of good cause provided a motion re-

questing an extension of time is filed within thirty days after the date the complaint is filed by the Director. A copy of the answer shall be served on the Director.

(c) *Content.* The respondent shall include in the answer a statement of the facts which constitute the grounds of defense and shall specifically admit or deny each allegation set forth in the complaint. The respondent shall not deny a material allegation in the complaint which the respondent knows to be true or state that respondent is without sufficient information to form a belief as to the truth of an allegation when in fact the respondent possesses that information. The respondent shall also state affirmatively special matters of defense.

(d) *Failure to deny allegations in complaint.* Every allegation in the complaint which is not denied by a respondent in the answer is deemed to be admitted and may be considered proven. No further evidence in respect of that allegation need be received by the administrative law judge at any hearing. Failure to timely file an answer will constitute an admission of the allegations in the complaint.

(e) *Reply by Director.* No reply to an answer is required by the Director and any new matter in the answer shall be deemed to be denied. The Director may, however, file a reply if he or she chooses or if ordered by the administrative law judge.

§10.137 Supplemental complaint

False statements in an answer may be made the basis of a supplemental complaint.

§10.138 Contested case

Upon the filing of an answer by the respondent, a disciplinary proceeding shall be regarded as a contested case within the meaning of 35 U.S.C. 24. Evidence obtained by a subpoena issued under 35 U.S.C. 24 shall not be admitted into the record or considered unless leave to proceed under 35 U.S.C. 24 was previously authorized by the administrative law judge.

§10.139 Administrative law judge; appointment; responsibilities; review of interlocutory orders; stays

(a) . *Appointment.* an administrative law judge, appointed under 5 U.S.C. 3105, shall conduct disciplinary proceedings as provided by this part.

(b) *Responsibilities.* The administrative law judge shall have authority to:

(1) Administer oaths and affirmations;

(2) Make rulings upon motions and other requests;

(3) Rule upon offers of proof, receive relevant evidence, and examine witnesses;

(4) Authorize the taking of a deposition of a witness in lieu of personal appearance of the witness before the administrative law judge;

(5) Determine the time and place of any hearing and regulate its course and conduct;

(6) Hold or provide for the holding of conferences to settle or simplify the issues;

(7) Receive and consider oral or written arguments on facts of law;

(8) Adopt procedures and modify procedures from time to time as occasion requires for the orderly disposition of proceedings;

(9) Make initial decisions under §10.154; and

(10) Perform acts and take measures as necessary to promote the efficient and timely conduct of any disciplinary proceeding.

(c) *Time for making initial decision.* The administrative law judge shall set times and exercise control over a disciplinary proceeding such that an initial decision under §10.154 is normally issued within six months of the date a complaint is filed. The administrative law judge may, however, issue an initial decision more than six months after a complaint is filed if in his or her opinion there exist unusual circumstances which preclude issuance of an initial decision within six months of the filing of the complaint.

(d) *Review of interlocutory orders.* An interlocutory order of administrative law judge will not be reviewed by the Commissioner except:

(1) when the administrative law judge shall be of the opinion (i) that the interlocutory order involves a controlling question of procedure or law as to which there is a substantial ground for a difference of opinion and (ii) that an immediate decision by the Commissioner may materially advance the ultimate termination of the disciplinary proceeding or

(2) in an extraordinary situation where justice requires review.

(e) *Stays pending review of interlocutory order.* If the Director or a respondent seek review of an interlocutory order of an administrative law judge under paragraph (b) (2) of this section, any time period set for taking action by the administrative law judge shall not be stayed unless ordered by the Commissioner or the administrative law judge.

§10.140 Representative for Director or respondent

(a) A respondent may be represented before the Office in connection with an investigation or disciplinary proceeding by an attorney. The attorney shall file a written declaration that he or she is an attorney within the meaning of §10.1(c) and shall state:

(1) the address to which the attorney wants correspondence related to the investigation or disciplinary proceeding sent and

(2) a telephone number where the attorney may be reached during normal business hours.

(b) In disciplinary proceedings, the Director shall be represented as provided in §10.4(b) (2).

§10.141 Filing of papers

(a) The provisions of §1.8 of this Subchapter do not apply to disciplinary proceedings.

(b) All papers filed after the complaint and prior to entry of an initial decision by the administrative law judge shall be filed with the administrative law judge at an address or place designated by the administrative law judge. All papers filed after entry of an initial decision by the administrative law judge shall be filed with the Director. The Director shall promptly forward to the Commissioner any paper which requires action under this part by the Commissioner.

§10.142 Service of papers

(a) All papers other than a complaint shall be served on a respondent represented by an attorney by:

(1) delivering a copy of the paper to the office of the attorney;

(2) mailing a copy of the paper by first-class mail or "Express Mail" to the attorney at the address provided by the attorney under §10.140(a) (1);

(3) any other method mutually agreeable to the attorney and a representative for the Director.

(b) All papers other than a complaint shall be served on a respondent who is not represented by an attorney by:

(1) delivering a copy of the paper to the respondent; or

(2) mailing a copy of the paper by first-class mail or "Express Mail" to the respondent at the address to which a complaint may be served or such other address as may be designated in writing by the respondent; or

(3) any other method mutually agreeable to the respondent and a representative of the Director.

(c) A respondent shall serve on the representative for the Director one copy of each paper filed with the administrative law judge or the Director. A paper may be served on the representative for the Director by:

(1) delivering a copy of the paper to the representative;

(2) mailing a copy of the paper by first-class mail or "Express Mail" to an address designated in writing by the representative; or

(3) any other method mutually agreeable to the respondent and the representative.

(d) Each paper filed in a disciplinary proceeding shall contain therein a certificate of service indicating:

(1) the date on which service was made and

(2) the method by which service was made.

(e) The administrative law judge or the Commissioner may require that a paper be served by hand or by "Express Mail."

(f) Service by mail is completed when the paper mailed in the United States is placed into the custody of the U. S. Postal Service.

§10.143 Motions

Motions may be filed with the administrative law judge. The administrative law judge will determine on a case-by-case basis the time period for response to a motion and whether replies to responses will be authorized. No motion shall be filed with the administrative law judge unless such motion is supported by a written statement by the moving party that the moving party or attorney for the moving party has conferred with the opposing party or attorney for the opposing party in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If issues raised by a motion are resolved by the parties prior to a decision on the motion by the administrative law judge, the parties shall promptly notify the administrative law judge.

§10.144 Hearings

(a) The administrative law judge shall preside at hearings in disciplinary proceedings. Hearings will be stenographically recorded and transcribed and the testimony of witnesses will be received under oath or affirmation. The administrative law judge shall conduct hearings in accordance with 5 U.S.C. 556. A copy of the transcript of the hearing shall become part of the record. A copy of the transcript shall be provided to the Director and the respondent at the expense of the Office.

(b) If the respondent to a disciplinary proceeding fails to appear at the hearing after a notice of hearing has been given by the administrative law judge, the administrative law judge may deem the respondent to have waived the right to a hearing and may proceed with the hearing in the absence of the respondent.

(c) A hearing in a disciplinary proceeding will not be open to the public except that the Director may grant a request by a respondent to open his or her hearing to the public and make the record of the disciplinary proceeding available for public inspection, *provided* agreement is reached in advance to exclude from public disclosure information which is privileged or confidential under applicable laws or regulations. If a disciplinary proceeding results in disciplinary action against a practitioner, the record of the entire disciplinary proceeding will be available for public inspection.

§10.145 Proof; variance; amendment of pleadings

In case of a variance between the evidence and the allegations in a complaint, answer, or reply, if any, the administrative law judge may order or authorize amendment of the complaint, answer, or reply to conform to the evidence. Any party who would otherwise be prejudiced by the amendment will be given reasonable opportunity to meet the allegations in the complaint, answer, or reply, as amended, and the administrative law judge shall make findings on any issue presented by the complaint, answer, or reply as amended.

§§10.146–10.149 [reserved]

§10.150 Evidence

(a) *Rules of evidence.* The rules of evidence prevailing in courts of law and equity are not controlling in hearings in disciplinary proceedings. However, the Administrative Law Judge shall exclude evidence which is irrelevant, immaterial, or unduly repetitious.

(b) *Depositions.* Depositions of witnesses taken pursuant to §10.151 may be admitted as evidence.

(c) *Government documents.* Official documents, records, and papers of the Office are admissible without extrinsic evidence of authenticity. These documents, records and papers may be evidenced by a copy certified as correct by an employee of the Office.

(d) *Exhibits.* If any document, record, or other paper is introduced in evidence as an exhibit, the administrative law judge may authorize the withdrawal of the exhibit subject to any conditions the administrative law judge deems appropriate.

(e) *Objections.* Objections to evidence will be in short form, stating the grounds of objection and the record may not include arguments thereon, except as ordered by the administrative law judge. Rulings on objections will be a part of the record. No exception to the ruling is necessary to preserve the rights of the parties.

§10.151 Depositions

(a) Depositions for use at the hearing in lieu of personal appearance of a witness before the administrative law judge may be taken by respondent or the Director upon a showing of good cause and with the approval of, and under such conditions as may be deemed appropriate by, the administrative law judge. Depositions may be taken upon oral or written questions, upon not less than ten days written notice to the other party, before any officer authorized to administer an oath or affirmation in the place where the deposition is to be taken. The requirement of ten days notice may be waived by the parties and depositions may then be taken of a witness and at a time and place mutually agreed to by the parties. When a deposition is taken upon written questions, copies of the written questions will be served upon the other party with the notice and copies of any written cross-questions will be served by hand or "Express Mail" within five days of the date of the taking of the deposition unless the parties mutually agree otherwise. A party on whose behalf a deposition is taken shall file a copy of a transcript of the deposition signed by a court reporter with the administrative law judge and shall serve one copy upon the opposing party. Expenses for a court reporter and preparing, serving, and filing depositions shall be borne by the party at whose instance the disposition is taken.

(b) When the Director and the respondent agree in writing, a deposition of any witness who will appear voluntarily may be taken under such terms and conditions as may be mutually agreeable to the Director and the respondent. The deposition shall not be filed with the administrative law judge and may not be admitted in evidence before the administrative law judge unless he or she orders the deposition admitted in evidence. The admissibility of the deposition shall lie within the discretion of the administrative law judge who may reject the deposition on any reasonable basis including the fact that demeanor is involved and that the witness should have been called to appear personally before the administrative law judge.

§10.152 Discovery

Discovery shall not be authorized except as follows:

(a) The administrative law judge may require parties to file and serve, prior to any hearing, a pre-hearing statement which contains

(1) A list (together with a copy) of all proposed exhibits to be used in connection with a party's case-in-chief,

(2) a list of proposed witnesses,

(3) the identity of government employees who have investigated the case and,

(4) copies of memoranda reflecting respondent's own statements to administrative representatives;

(b) After a witness testifies for a party, if the opposing party requests, the party may be required to produce, prior to cross-examination, any written statement made by the witness.

§10.153 Proposed findings and conclusions; post hearing memorandum

Except in cases when the respondent has failed to answer the complaint, the administrative law judge, prior to making an initial decision, shall afford the parties a reasonable opportunity to submit proposed findings and conclusions and a post-hearing memorandum in support of the proposed findings and conclusions.

§10.154 Initial decision of administrative law judge

(a) The administrative law judge shall make an initial

decision in the case. The decision will include (a) a statement of findings and conclusions, as well as the reasons or basis therefor with appropriate references to the record, upon all the material issues of fact, law, or discretion presented on the record, and (b) an order of suspension or exclusion from practice, an order of reprimand, or an order dismissing the complaint. The administrative law judge shall file the decision with the Director and shall transmit a copy to the representative of the Director and respondent or the respondent's attorney of record. In the absence of an appeal to the Commissioner, the decision of the administrative law judge will, without further proceedings, become the decision of the Commissioner of Patents and Trademarks thirty (30) days from the date of the decision of the administrative law judge.

(b) The initial decision of the administrative law judge shall explain the reason for any penalty of suspension or exclusion. In determining any penalty, the following should normally be considered:

(1) the public interest;

(2) the seriousness of the violation of the Disciplinary Rule;

(3) the deterrent effects deemed necessary; and

(4) the integrity of the legal profession.

§10.155 Appeal to the Commissioner

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under §10.154, either party may appeal to the Commissioner. An appeal by the respondent will be filed with the Director in duplicate and will include expectations to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal, the Director shall serve a copy of the appeal on the respondent. Within thirty (30) days after receipt of an appeal or copy thereof, the other party may file a reply brief in duplicate with the Director. If the Director files the reply brief, the Director shall serve a copy of the reply brief on the respondent. Upon the filing of an appeal and a reply brief, if any, the Director shall transmit the entire record to the Commissioner.

(b) The appeal will be decided by the Commissioner on the record made before the administrative law judge.

§10.156 Decision of the Commissioner

(a) An appeal from an initial decision of the adminstrative law judge shall be decided by the Commissioner. The Commissioner may affirm, reverse, or modify the initial decision or remand the matter to the administrative law judge for such further proceedings as the Commissioner may deem appropriate. Entry of a decision by the Commissioner is a final agency action in a disciplinary proceeding. In making a final decision, the Commissioner shall review the record or those portions of the record as may be cited by the parties in order to limit the issues. The Commissioner shall transmit a copy of the final decision to the Director. The Director shall transmit a copy of the Commissioner's final decision to respondent.

(b) A final decision of the Commissioner may dismiss a disciplinary proceeding, reprimand a practitioner, or may suspend or exclude the practitioner from practice before the Office.

§10.157 Review of Commissioner's final decision

Review of the Commissioner's final decision in a disciplinary case may be had by a petition filed in the United States District Court for the District of Columbia. See 35 U.S.C. 32 and Local Rule 1-16 of the United States District Court for the District of Columbia.

§10.158 Suspended or excluded practitioner

(a) A practitioner who is suspended or excluded from practice before the Office under §10.156(b) shall not engage in unauthorized practice of patent, trademark and other non-patent law before the Office.

(b) Unless otherwise ordered by the Commissioner, any practitioner who is suspended or excluded from practice before the Office under §10.156 (b) shall:

(1) Within 30 days of entry of the order of suspension or exclusion, notify all clients of the practitioner or the practitioner's firm in separate written communications of the suspension or exclusion and shall file a copy of each written communication with the Director.

(2) Within 30 days of entry of the order of suspension or exclusion, surrender a client's active case files to (i) the client or (ii) another practitioner designated by the client.

(3) Not hold himself or herself out as authorized to practice law before the Office.

(4) Promptly take any necessary and appropriate steps to remove from any telephone, legal, or other directory any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice patent, trademark or other non-patent law before the Office and, within 30 days of taking those steps, file with the Director an affidavit describing the precise nature of the steps taken.

(5) Not advertise the practitioner's availability or ability to perform or render legal services for any person having immediate, prospective, or pending business before the Office.

(6) Not render legal advice or services to any person having immediate, prospective, or pending business before the Office as to that business.

(7) Promptly take steps to change any sign identifying a practitioner's or the practitioner's firm's office and the practitioner's or the practitioner's firm's stationery to delete therefrom any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice law before the Office.

(8) Within 30 days, return to any client any unearned funds, including any unearned retainer fee, and any securities and property of the client.

(c) A practitioner who is suspended or excluded from practice before the Office and who aides another practitioner in any way in the other practitioner's practice of law before the Office, may, under the direct supervision of the other practitioner, act as a para-legal for the other practitioner or perform other services for the other practitioner which are normally performed by lay-persons, *provided*: (1) the practitioner who is suspended or excluded is (i) a salaried employee of the other practitioner or the other practitioner's law firm and (ii) does not share profits with the other practitioner or the other practitioner's law firm; (2) the other practitioner assumes full professional responsibility to any client and the Office for any work performed by the suspended or excluded practitioner for the other practitioner; (3) the suspended or excluded practitioner, in connection with any immediate, prospective, or pending business before the Office, does not (i) communicate directly in writing, orally, or otherwise with a client of the other practitioner, (ii) render any legal advice, or any legal services, to a client of the other practitioner, or (ii) meet in person or in the presence of the other practitioner, with any client of the other practitioner or the other practitioner's law firm or any witness or potential witness which the other practitioner or the other practitioner's law firm may or intends to call as a witness in any proceeding before the Office. The term "witness" includes individuals who will testify orally in a proceeding before, or sign an affidavit or any other document to be filed in, the Office.

(d) When a suspended or excluded practitioner acts as a para-legal or performs services under paragraph (c) of this section, the suspended or excluded practitioner shall not thereafter be reinstated to practice before the Office unless:

(1) the suspended or excluded practitioner shall have filed with the Director an affidavit which (i) explains in detail the precise nature of all para-legal or other services performed by the suspended or excluded practitioner and (ii) shows by clear and convincing evidence that the suspended or excluded practitioner has complied with the provisions of this section and all Disciplinary Rules and

(2) the other practitioner shall have filed with the Director a written statement which (i) shows that the other

practitioner has read the affidavit required by subparagraph (d) (1) of this section and that the other practitioner believes every statement in the affidavit to be true and (ii) states why the other practitioner believes that the suspended or excluded practitioner has complied with paragraph (c) of this section.

10.159 Notice of suspension or exclusion

(a) Upon issuance of a final decision reprimanding a practitioner or suspending or excluding a practitioner from practice before the Office, the Director shall give notice of the final decision to appropriate employees of the Office and to interested departments, agencies, and courts of the United States. The Director shall also give notice to appropriate authorities of any State in which a practitioner is known to be a member of the bar.

(b) The Director shall cause to be published in the *Official Gazette* the name of any practitioner suspended or excluded from practice. Unless otherwise ordered by the Commissioner, the Director shall publish in the *Official Gazette* the name of the practitioner reprimanded by the Commissioner.

(c) The Director shall maintain records, which shall be available for public inspection, of every disciplinary proceeding where a practitioner is reprimanded, suspended, or excluded unless the Commissioner orders that the proceedings be kept confidential.

10.160 Petition for reinstatement

(a) A petition for reinstatement of a practitioner suspended for a period of less than five years will not be considered until the period of suspension has passed.

(b) A petition for reinstatement of a practitioner excluded from practice will not be considered until five years after the effective date of the exclusion.

(c) A practitioner who has been suspended or excluded may file a petition for reinstatement. The Director may grant a petition for reinstatement if the Director is satisfied that the suspended or excluded practitioner will conduct himself or herself in accordance with the regulations of this part and that granting a petition for reinstatement is not contrary to the public interest. As a condition to reinstatement, the Director may require a practitioner to

(1) meet the requirements of §10.7, including taking and passing an examination under §10.7(b) and

(2) pay all or a portion of the costs and expenses, not to exceed $1,500, of the disciplinary proceeding which lead to suspension or exclusion.

(d) Any suspended or excluded practitioner who has violated the provisions of §10.158 during his or her period of suspension or exclusion shall not be entitled to reinstatement until such time as the Director is satisfied that a period of suspension equal in time to that ordered by the Commissioner or exclusion for five years has passed during which the suspended or excluded practitioner has complied with the provisions of §10.158.

(e) Proceedings on any petition for reinstatement shall be open to the public. Before reinstating any suspended or excluded practitioner, the Director shall publish in the *Official Gazette* a notice of the suspended or excluded practitioner's petition for reinstatement and shall permit the public a reasonable opportunity to comment or submit evidence with respect to the petition for reinstatement.

§10.161 Savings clause

(a) A disciplinary proceeding based on conduct engaged in prior to the effective date of these regulations may be instituted subsequent to such effective date, if such conduct would continue to justify suspension or exclusion under the provisions of this part.

(b) No practitioner shall be subject to a disciplinary proceeding under this part based on conduct engaged in before the effective date hereof if such conduct would not have been subject to disciplinary action before such effective date.

DONALD J. QUIGG
Deputy Commissioner of Patents and Trademarks

Mar. 8, 1984.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 10, 1984

PP. 5,167	4,401,024	4,415,693	4,423,310
D. 270,884	4,401,188	4,416,056	4,423,458
4,245,865	4,401,534	4,416,859	4,424,055
4,261,172	4,402,184	4,417,099	4,424,088
4,307,143	4,402,598	4,417,288	4,424,137
4,321,028	4,402,835	4,417,892	4,424,327
4,335,754	4,403,850	4,418,147	4,424,771
4,339,990	4,406,053	4,418,238	4,425,242
4,346,195	4,406,754	4,418,451	4,425,259
4,349,509	4,407,082	4,418,815	4,425,331
4,350,777	4,407,170	4,418,991	4,425,366
4,355,512	4,407,518	4,419,357	4,425,453
4,371,286	4,408,042	4,419,428	4,425,688
4,386,073	4,410,147	4,419,571	4,425,718
4,386,837	4,410,411	4,419,645	4,425,747
4,387,664	4,410,544	4,419,882	4,425,955
4,388,641	4,411,122	4,419,973	4,425,956
4,388,725	4,411,712	4,420,189	4,426,917
4,388,767	4,412,728	4,421,718	4,427,079
4,390,599	4,412,833	4,421,989	4,427,642
4,393,168	4,413,040	4,422,308	4,427,720
4,394,189	4,413,225	4,422,454	4,427,742
4,396,463	4,413,917	4,422,740	4,427,781
4,398,949	4,413,931	4,422,950	4,428,075
4,399,181	4,414,374	4,423,229	
4,400,415	4,414,850	4,423,247	

Disclaimers

3,430,731.—*Gebhard Satzinger,* Bad Kissingen, Germany. LUBRICATOR. Patent dated Mar. 4, 1969. Disclaimer filed Feb. 2, 1984, by the assignee, *Gebhard Satzinger Metallwarenfabrik,* Bad Kissingen, Germany.

Hereby enters this disclaimer to all claims of said patent.

3,437,747.—*Edward E. Sheldon,* New York, N.Y. DEVICES FOR INSPECTION USING FIBEROPTIC MEMBERS. Patent dated Apr. 8, 1969. Disclaimer filed Feb. 2, 1984, by the *inventor.*

The term of this patent subsequent to Nov. 15, 1983 has been disclaimed.

3,842,939.—*Roland Satzinger,* Euerdorf, Germany. GREASE BOX FOR DISPENSING LUBRICANT. Patent dated Oct. 22, 1974. Disclaimer filed Feb. 2, 1984, by the assignee, *Gebhard Satzinger Metallwarenfabrik,* Bad Kissingen, Germany.

Hereby enters this disclaimer to claims 1 and 4–6 of said patent.

4,255,612.—*Michael A. Grundfest,* Forest Hills, N.Y. INSULATOR FOR COVERING ELECTRIC CABLES. Patent dated Mar. 10, 1981. Disclaimer filed Aug. 5, 1983, by the assignee, *Thomas & Betts Corp.*

Hereby enters this disclaimer to claims 1 through 34 and 38 through 40 of said patent.

4,391,866.—*Robert C. Pickens, Jr.,* Gurnee; *Reese R. Thomas,* Libertyville and *Ronald Somerville,* Gurnee, all of Ill. CUT PILE FABRIC WITH TEXTURIZED LOOPS. Patent dated July 5, 1983. Disclaimer filed Feb. 4, 1984, by the assignee, *Ozite Corp.*

The term of this patent subsequent to June 21, 2000 has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 3, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director 10-28-82
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.

GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director 5-12-76
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.

HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director 1-05-83
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.

COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director 7-26-82
Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.

SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—
R. F. WHITE, Director 1-16-76
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director 3-22-82
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.

SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director 6-01-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.

INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director 7-06-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.

RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—
G. M. FORLENZA, Director 6-18-82
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.

ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director 9-30-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.

DESIGN, GROUP 290—KENNETH L. CAGE, Director 1-14-71
Industrial Arts; Household, Personal and Fine Arts.

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 3-16-82
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.

MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director 6-30-82
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.

AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—
R. E. AEGERTER, Director 11-04-76
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.

HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director 11-20-81
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.

GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—
A. L. SMITH, Director 7-23-81
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.

Expiration of patents: The patents within the range of numbers indicated below expire during March 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,307,200 to 3,311,920, inclusive
Plant Patents ..... Numbers 2,723 to 2,729 inclusive

REISSUES

APRIL 10, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,549

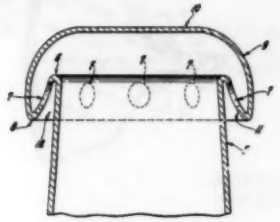
ONE-PIECE ROOF VENT DEVICE AND METHODS OF CONSTRUCTING AND UTILIZING SAME

James W. Ballard, Livonia, and Larry R. Ballard, Redford Township, Marquette County, both of Mich., assignors to Charles Bonnici, Mich.

Original No. 42,145,136, dated Jul. 29, 1980, Ser. No. 968,192, Dec. 11, 1978. Application for reissue Oct. 3, 1980, Ser. No. 193,711

Int. Cl.³ F24F *13/08*

U.S. Cl. 98—42 R **12 Claims**



9. A one-piece ventilation apparatus, comprising:

a substantially horizontal flat annular base portion;

a substantially hollow, substantially vertically elongated portion extending integrally upwardly from said annular base portion;

said substantially hollow elongated portion having a generally circular cross-sectional shape which decreases in diameter upwardly along at least a portion of the length of said hollow elongated portion;

a first bend portion extending integrally radially outwardly and downwardly from the upper end of said hollow portion;

a vent-hole portion formed integrally with said first bend portion;

a second bend portion extending integrally radially outwardly from said vent-hole portion;

an arcuate cap side portion extending integrally upwardly from said second bend portion;

a substantially horizontal cap top portion extending integrally above said arcuate cap side portion;

said vent-hole portion having a plurality of vent holes provided therein; and

said apparatus being entirely integrally and unitarily formed from a single piece of deformable material.

Re. 31,550

N-(2-CHLORO-4-PYRIDYL) UREAS

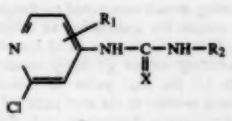
Koichi Shudo, 2000-10-2-116, Kosugayacho, Totsukaku, Yokohamashi, Kanagawa; Toshihiko Okamoto, 1-7-21, Shinoharakita, Kohokuku, Yokohamashi, Kanagawa; Yo Isogai, 1-1-2-609, Kamiyoga, Setagayaku, Tokyo, and Soshiro Takahashi, 904-10, Oaza, Kamiokubo, Urawashi, Saitama, all of Japan, assignors to Koichi Shudo; Toshihiko Okamoto, both of Yokohama; Yo Isogai, Tokyo and Soshiro Takahashi, Saitama, all of, Japan

Original No. 4,193,788, dated Mar. 18, 1980, Ser. No. 947,468, Oct. 2, 1978. Application for reissue Sep. 25, 1981, Ser. No. 305,768

Int. Cl.³ A01N *9/22*; C07D *401/12, 213/46, 213/52*

U.S. Cl. 71—94 **17 Claims**

1. A compound selected from the group consisting of N-(2-chloro-4-pyridyl)ureas of the following formula



wherein R_1 represents hydrogen or alkyl of from 1 to 3 carbon atoms, inclusive; R_2 represents aryl selected from the group consisting of phenyl, which may be substituted by alkyl of from 1 to 3carbon atoms, inclusive; alkoxy; of from 1 to 3 carbon atoms, inclusive; or halogen; and X stands for oxygen or sulfur; and acid addition salts thereof.

Re. 31,551

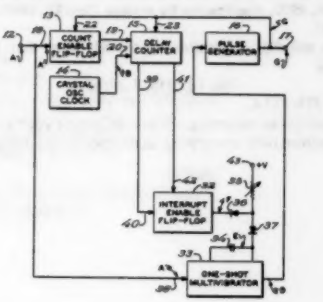
DIGITAL DELAY GENERATOR

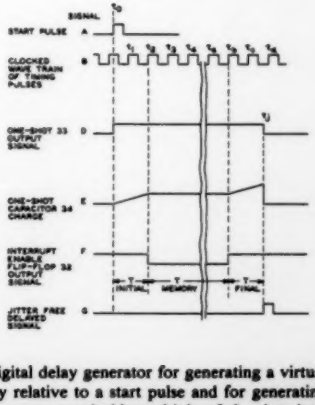
Merlin D. Bjorke, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Original No. 4,260,912, dated Apr. 7, 1981, Ser. No. 968,535, Dec. 11, 1978. Application for reissue Dec. 30, 1981, Ser. No. 336,009

Int. Cl.³ H03K *17/296, 17/28, 5/05*

U.S. Cl. 307—597 **19 Claims**





1. A digital delay generator for generating a virtually jitter free delay relative to a start pulse and for generating such a delay over any practicable multiple of the time interval be-

tween timing pulses, such multiple including a non-integer, comprising:

delay means responsive to the start pulse and to the timing pulses for generating first and second signal edges, the second signal edge occurring later in time than the first signal edge, both signal edges occurring following the start pulse and in timed relation to the timing pulses; and

signal generating means connected to the delay means and having an output for generating an output signal which includes a timing cycle of a fixed known duration, the signal generating means [being] *comprising means* responsive to (*1*) the start pulse for initiating the timing cycle *in timed relation to the start pulse,* (*2*) the first signal edge for interrupting the timing cycle [for an indefinite period] *to initiate a hold thereon,* and (*3*) the second signal edge for reestablishing the timing cycle and permitting the timing cycle to continue, [the output signal] *the signal generating means further comprising means for* beginning *the output signal* in timed relation to the [start pulse] *beginning of the timing cycle* and *for* terminating *the output signal* in timed relation to the end of the timing cycle following interruption, so that a virtually jitter free delay with respect to the start pulse is generated.

Re. 31,552

ELECTRON BEAM AND DEFLECTION YOKE ALIGNMENT FOR PRODUCING CONVERGENCE OF PLURAL IN-LINE BEAMS

Robert L. Barbin, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Original No. 3,789,258, dated Jan. 29, 1974, Ser. No. 245,862, Apr. 20, 1972. Application for reissue Dec. 19, 1980, Ser. No. 218,367

Claims priority, application United Kingdom, Jan. 14, 1972, 01779/72

Int. Cl.³ H01J *29/50*

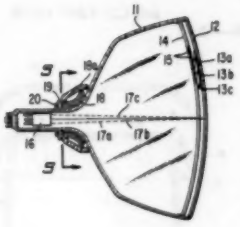
U.S. Cl. 315—13 C **9 Claims**

1. A method of mounting a beam deflection yoke relative to a color picture tube comprising an envelope containing a color phosphor screen, an electron gun assembly for projecting a plurality of electron beams toward said screen and a deflection region for said beams, said method comprising:

supporting said tube in a predetermined position;

temporarily supporting said deflection yoke loosely assembled around said picture tube adjacent said deflection region;

operating said tube and yoke to project said beams toward said screen and to scan said beams in separate rasters on



said screen, and simultaneously adjusting the transverse position of said yoke relative to said picture tube while maintaining [substantial] parallelism of the longitudinal axes of said yoke and picture tube to achieve substantial convergence of said beams and coincidence of said rasters on said screen *without the use of dynamic convergence correction means*; and

fixedly attaching said yoke to said picture tube in said adjusted position.

PLANT PATENTS

GRANTED APRIL 10, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,216

MINIATURE CARNATION

Angelo J. Siri, San Francisco, Calif., assignor to Siri Brothers Nursery, Inc., East Palo Alto, Calif.

Filed Jul. 12, 1982, Ser. No. 397,113

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct variety of miniature carnation plant, substantially as herein shown and described.

5,217

MINIATURE CARNATION

Angelo J. Siri, San Francisco, Calif., assignor to Siri Brothers Nursery, Inc., East Palo Alto, Calif.

Filed Jul. 12, 1982, Ser. No. 397,115

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct variety of miniature carnation plant, substantially as herein shown and described.

5,218

MINIATURE CARNATION

Angelo J. Siri, San Francisco, Calif., assignor to Siri Brothers Nursery, Inc., East Palo Alto, Calif.

Filed Jul. 12, 1982, Ser. No. 397,116

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct variety of miniature carnation plant, substantially as herein shown and described.

PATENTS

GRANTED APR. 10, 1984

ERRATA

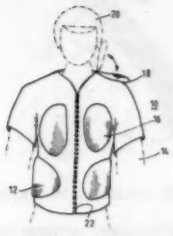
For CLASS	See PATENT NO.
292–336	4,441,236
604–415	4,441,538
222–324	4,441,629
417–282	4,441,872
502–150	4,442,022
502–222	4,442,023
502–334	4,442,024
346–208	4,442,176
204–159	4,442,302

PATENTS

GRANTED APRIL 10, 1984

GENERAL AND MECHANICAL

4,441,211
PROTECTIVE BATTING JACKET
Byron A. Donzis, Houston, Tex., assignor to Houston Protective Equipment, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 478,681, Mar. 25, 1983, which is a continuation-in-part of Ser. No. 357,588, Mar. 12, 1982, abandoned. This application Jul. 11, 1983, Ser. No. 512,238
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **12 Claims**



1. A garment adapted to be worn by a person such as a batter to protect said person from infliction of an externally applied force occasioned by a pitched ball or the like, said garment comprising:

jacket structure adapted to be worn by said person, said jacket structure including:

a collar region adapted to be disposed proximate the collar bone of said person;

a shoulder region adapted to be disposed adjacent a shoulder of said person; and

at least one shock absorbing structure selectively positioned to be adjacent at least one predetermined body location of said person, said at least one shock absorbing structure including:

a neck protector pad depending from said jacket structure proximate said collar region, said neck protector pad being selectively positionable in a first position proximate the shoulder region of said jacket structure, and in a second position angled approximately ninety degrees from said first position wherein said neck protector pad is adapted to protect the neck of said person;

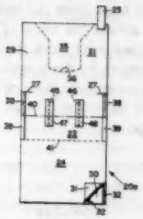
wherein at least one of said shock absorbing structures comprises:

a flexible enclosure having first and second faces and a periphery defining a chamber, said first and second faces being air impermeable and said periphery having at least one air impermeable region and at least one air permeable region such that said chamber is in continuous fluid communication with the atmosphere outside the shock absorbing structure;

a flexible open-celled foam portion having first and second faces disposed adjacent to and bonded at least in part to said first and second faces, respectively, of the flexible enclosure, and having a periphery disposed adjacent said periphery of the flexible enclosure, the cells of said foam portion releasably holding a volume of air selectively varied between first and second volumes differing by a volume differential in response to application and removal of the force on the shock absorbing structure, said volume differential being transferred between the foam portion and the atmosphere outside the shock absorbing structure through said at least one air permeable region of the periphery of the flexible enclosure; and

shield structure disposed adjacent one of said first and second faces of the foam portion to distribute the applied force across at least a portion of said one face.

4,441,212
BIB
Nicholas A. Ahr, and David M. Moret, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Sep. 30, 1982, Ser. No. 431,897
Int. Cl.³ A41B *13/10;* **A41D** *13/04*
U.S. Cl. 2—49 R **9 Claims**



1. A bib comprising a top panel, a substantially full-width pocket panel disposed at the bottom end of said top panel, an apron panel which extends downward below said pocket panel, and means for securing said bib on a user, said pocket panel having a transverse upper edge, and the upper edge of said apron panel being secured to said transverse upper edge so that said apron panel pendulously depends from said transverse upper edge of said pocket, said top panel being cut adjacent each of the top corners of said pocket to promote gravitational opening of said pocket when said bib is applied to a wearer thereof.

4,441,213
FLEXIBLE TEAR RESISTANT PROTECTIVE GLOVE FOR USE ON HIGH VOLTAGE SYSTEMS
William P. Trumble, Kanata; Ivan E. Martin, and Clement E. Berthiaume, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Jun. 7, 1982, Ser. No. 385,431
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 R **6 Claims**

1. A seamless, flexible, tear resistant protective glove comprising:

an inner layer of natural rubber of a thickness of at least about 0.040 inches;

an outer layer of a urethane elastomer bonded to said inner layer and of a thickness of at least about 0.003 inches;

a plurality of bulges extending laterally across the back of the glove, said bulges defined by seamless extensions of said layers from the normal contour of the glove and molded integrally therewith, the glove having a back portion, fingers and thumb;

said bulges comprising; a first bulge extending transversely across the back portion of the glove at a position substantially aligned with the junction of metacarpal bones and phalanges of a user;

a second bulge extending transversely across the back portion of the glove, spaced from and substantially parallel to said first bulge at a position substantially overlying the upper part of the metacarpus of the user;

an individual bulge across the back of each finger and positioned at the first joint from the metacarpus;

a bulge extending across the back of the thumb and positioned at the second joint from the thumb tip;

said bulges extending to be flush with the sides of the back portion of the glove and the sides of the fingers and thumb respectively, and including a transition portion at each end of each bulge.

4,441,214

PROTECTIVE HEAD SHIELD

Linda B. Werner, and William A. Werner, both of Salem, Oreg., assignors to Custom Stamping Mfg. Co., Portland, Oreg.

Filed Sep. 28, 1982, Ser. No. 425,560

Int. Cl.³ A42B *1/18*

U.S. Cl. 2—174 **1 Claim**

1. A head shield for protection of the face and clothing during application of hair treatment liquid comprising;

a multiple-ply strip of moisture absorbent fabric having an extended length substantially greater than the distance around the head of the user;

a flexible non-permeable sheet having one edge thereof longer than the distance around the users head but substantially shorter than the extended length of the absorbent fabric;

an elastic band expansible to substantially the length of the aforesaid one edge of said non-permeable sheet;

means securing the absorbent fabric and the elastic band to said non-permeable sheet along said one edge thereof to form along said one edge a highly puckered expansible band of said absorbent fabric, said one edge of said non-permeable sheet being normally in puckered configuration and being expansible by stretching the elastic strip secured thereto to extend around the head of the user; and

means for securing the respective ends of said one edge together thereby fixing the puckered absorbent fabric around and against the user's head and permitting the non-permeable sheet to drape down over the face and clothing of the user or to be wrapped upwardly about the hair of the user, the puckered absorbent fabric around and against the user's head effectively absorbing excess hair treating liquid during use.

4,441,215

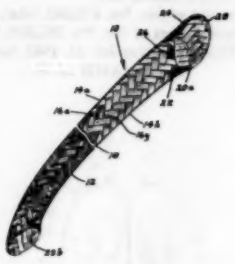
VASCULAR GRAFT

Robert L. Kaster, 2730 Vagabond La., Plymouth, Minn. 55447

Continuation of Ser. No. 207,678, Nov. 17, 1980, abandoned. This application Feb. 23, 1983, Ser. No. 469,174

Int. Cl.³ A61F *1/00, 1/24*

U.S. Cl. 3—1.4 **9 Claims**



1. Non-corrugated vascular graft implantable prosthesis comprising:

a. tubular member including an inner layer comprising a plurality of filament arrays, each said filament array including at least three filaments that are disposed as a group substantially parallel and coplanar with respect to one another, and a compliant outer covering of material, said plurality of filament arrays being braided together to form a non-corrugated inner braided tube;

b. inflow and outflow orifices at each end of said tubular member; and,

c. means securing said filaments at said orifices to adjacent filaments and filament ends whereby said tubular member provides a flexible vascular graft thereby providing for passage of blood through said vascular graft.

4,441,216

TISSUE HEART VALVE AND STENT

Marian I. Ionescu, Leeds, England; Jay A. Lenker, Laguna Beach, and Robert F. Rosenbluth, Laguna Niguel, both of Calif., assignors to Shiley, Inc., Irvine, Calif.

Filed Dec. 3, 1981, Ser. No. 327,081

Claims priority, application European Pat. Off., Oct. 29, 1981, 81305122.4

Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 **17 Claims**

1. A stent for a tissue heart valve having tissue cusps and coaptation stitches, said stent for reducing stress in the tissue of the cusps comprising:

a ring with scallops formed therein defining an aperture with inflow and outflow ends; and

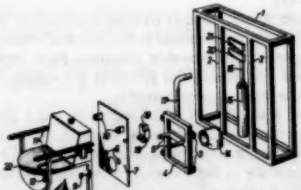
a plurality of legs coupled to said ring and extending upwardly toward said outflow end each said leg dimensioned such that the radius of curvature of mobile tissue around and near the stent measured at the point of greatest

curvature divided by the thickness of the tissue is greater than or equal to five at all points of contact between said tissue and said stent.

4,441,217
INTRAOCULAR LENSES
Charles H. Cozean, Jr., 937 Broadway, Cape Girardeau, Mo. 63701
Filed Dec. 21, 1981, Ser. No. 332,533
Int. Cl.³ A61F 1/16, 1/24
U.S. Cl. 3—13 9 Claims

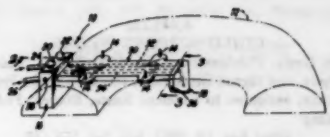
1. An intraocular lens structure suitable for use as an artificial lens implant which comprises a light focusing lens body and a plurality of oppositely disposed support members for supporting said intraocular lens structure upon implantation in the eye, said oppositely disposed support members terminating with a plurality of oppositely disposed contact lobes having intersecting axis lines that define the geometric center of said support members and which are adapted to contact natural regions of the eye upon implantation, to position the intersection of the axis lines which are defined by the oppositely disposed contact lobes in alignment with and corresponding to the geometric center axis of the cornea, said light focusing lens body being affixed to said support members at a position whereby the optical axis of said light focusing lens is offset from said support members geometric center and the geometric center axis of the cornea and whereby said optical axis corresponds with and is in alignment with the pupillary axis.

4,441,218
POSITION ADJUSTING DEVICE FOR SANITARY AND PLUMBING UNITS USING WATER UNDER PRESSURE
Stig H. E. Trybom, Pampusvägen 59, S-60365 Norrköping, Sweden
Continuation of Ser. No. 188,133, Sep. 17, 1980, abandoned. This application Aug. 17, 1982, Ser. No. 408,809
Claims priority, application Sweden, Sep. 18, 1979, 7907709
Int. Cl.³ E03D 11/00
U.S. Cl. 4—252 R 3 Claims



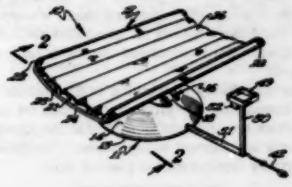
2. The device of claim 1 wherein said water pressure control means further comprises means extending from said position near the hands of the user to valve means connected to control a supply of said water.

4,441,219
LAVATORY ACCESSORY
Harry Epstein, 687 Kildare Crescent, Seaford, N.Y. 11783
Filed Jul. 26, 1982, Ser. No. 402,006
Int. Cl.³ A61H 35/00; E03D 9/08
U.S. Cl. 4—448 28 Claims



1. A lavatory accessory for use with a toilet having a seat, a bowl, and a water source, comprising:
- a secondary fluid source;
- a manually operable fluid valve means having a first inlet and outlet corresponding to the water source and a second inlet and outlet corresponding to said secondary fluid source;
- first and second fluid conduit means connecting the water source and said secondary fluid source to the corresponding first and second inlets of said valve means;
- head means having a water inlet and a secondary fluid inlet both connected through internally arranged fluid passages to an outlet jet formed therein;
- third and fourth conduit means connecting said first and second outlets of said valve means to the corresponding inlets of said head means; and
- said fluid passages in said head means including a venturi tube between said water inlet and said outlet jet, for forming a low pressure zone thereat upon passage of water therethrough, said fluid passages further including a passage connecting said secondary fluid inlet in said head means to said venturi tube, whereby secondary fluid is drawn from said secondary fluid source, mixed with the water and expelled from said outlet jet.

4,441,220
RECREATIONAL APPARATUS
Lester W. Peterson, Lafayette, Minn. 56054
Filed Jan. 15, 1982, Ser. No. 339,484
Int. Cl.³ A47G 9/00
U.S. Cl. 5—431 6 Claims



1. An article of furniture for supporting a user in a reclining position during sunning and being operable to permit the user to obtain an even suntan, comprising:
- a base structure for engaging the ground surface;
- an elongate, generally horizontal support adapted to support a user thereon in a reclining position during sunning, said support having an upper surface, a lower surface, end edges and longitudinal side edges;
- pivot means interconnecting the support with said base to permit limited lateral tilting movement of said support about an axis extending longitudinally of the latter, means interconnecting the support with said base to permit longitudinal tilting movement of said support about an axis extending transversely of the latter, and means intercon-

necting said support with said base permitting rotation of the support relative to the base;

power means drivingly connected with the support for rotating the latter approximately two revolutions per hour whereby a user lying on said support will obtain an even tan on that surface of the user's body exposed to the sun.

4,441,221

CHILD SUPPORT WEDGE

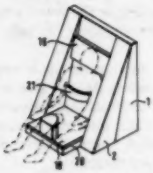
Klemens Enste, Hitchinstrasse 36, 6530 Bingen, Fed. Rep. of Germany, and Sigrun Giessmann, Rockenhausen, Fed. Rep. of Germany, assignors to Klemens Enste, Bingen, Fed. Rep. of Germany

Filed Jun. 15, 1982, Ser. No. 388,645

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1981, 3123632

Int. Cl.³ A61G 7/02

U.S. Cl. 5—431 **15 Claims**



1. A gymnastic and support wedge for multiple and severely handicapped children of kindergarten and school age, comprising:

a wedge-like base plate member, said base plate member being rectangular and having an upper side and two longitudinal sides and having two longitudinally-extending flaps on its upper side which are each disposed along and spaced at a predetermined distance from an opposite longitudinal side of said base plate;

a pair of lateral trough wedge members mountable on said base plate member, each having a width equal to the predetermined distance of the disposition of each of said flaps from an opposite longitudinal side of said base plate;

a plurality of differently shaped individual members mountable between said trough wedge members in any desired position, wherein said individual members comprise a head wedge, two flat pillows for reducing the trough between said trough wedge members, a semi-cylindrical roll, a flat pillow having an integrated abduction wedge and a lower pillow associated therewith and two fixation belts; and

means for detachably connecting said members to one another comprising a multiplicity of stick-on and padded belts which are arrangeable such that the person using the gymnastic and support wedge comes in contact with only the partially freely-exposed padded belts.

4,441,222

AUTOMATIC BED MAKER

Peter J. Tascarella, 2526 Brookdale Ave., Roslyn, Pa. 19001

Filed Jul. 30, 1981, Ser. No. 288,614

Int. Cl.³ A47C 21/00, 21/02

U.S. Cl. 5—488 **15 Claims**

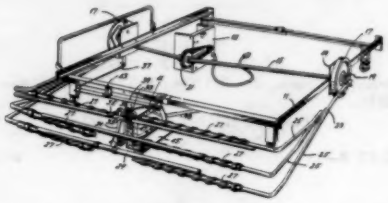
1. An automatic bed maker apparatus, comprising:

a bed frame;

at least one bed covering;

means for securing each said bed covering individually at the foot of said bed frame, said securing means being connected to said bed frame; and

means for extending each said individual bed covering up from the bottom of the bed frame while simultaneously making it smooth from the center toward the sides of said bed frame by helical screw action, said extending and



making smooth means being connected to said securing means.

4,441,223

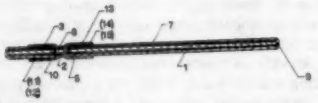
HEALTHFUL QUILT

Ling-Kuo Yang, No. 1, Lane 23, Hsien Cheng St., Tainan, Taiwan

Filed Mar. 30, 1982, Ser. No. 363,478

Int. Cl.³ A47G 9/02

U.S. Cl. 5—494 **1 Claim**



1. A kind of quilt consisting of a cotton sheet and a cover wrapping around the cotton sheet; both the cotton sheet and the cover equipped with a long head hole on one end of them, of the same size and at the same location for a user's head to pass through; the cotton sheet having two bands and two buttons and two button holes sewn on the upper and under sides near the head hole; the cover having two flaps and two hooks and two eyes sewn both on the upper and under sides near the head hole; the bands, the buttons, the button holes, the flaps, the hooks, and the eyes, all serving for covering or uncovering the head hole for two ways of use.

4,441,224

METHOD OF CONTINUOUSLY TREATING A FIBROUS SUSPENSION

Oliver A. Laakso, Haralyn (West), #2 Middle Rd., Smith Parish, Bermuda 3-18

Division of Ser. No. 374,763, May 4, 1982. This application May 27, 1983, Ser. No. 498,801

Int. Cl.³ D21D 1/40

U.S. Cl. 8—156 **7 Claims**

1. A method of continuously treating a suspension of comminuted cellulosic fibrous material in a cylindrical vessel utilizing stationary screens and movable treatment-fluid introduction structures and minimizing the potential for screen clogging, comprising the steps of continuously:

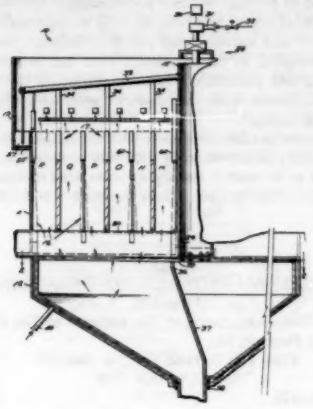
(a) defining a plurality of radial segments, and a plurality of vertical channels in each radial segment, in the vessel;

(b) introducing the suspension, adjacent the vessel bottom to flow upwardly in the vessel in a moving suspension column, into a cross-sectional area in the vessel corresponding to that of approximately one of the radial segments;

(c) introducing treatment liquid with the movable fluid introducing structures so that shock waves acting on the stationary screens as a result of liquid introduction are minimized;

(d) substantially continuously withdrawing liquid from the majority of the stationary screens area;

(e) terminating extraction from the screens in each radial segment approximately when the suspension is being introduced therein; and



(f) continuously removing from a top portion of the vessel, above the level of the screens, a portion of the entire radial extent of the suspension at the top of the column preceding the radial segment into which the suspension is being introduced at the bottom of the column.

4,441,225

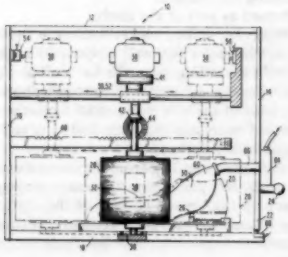
SHOESHINING MACHINE AND METHOD OF SUPPORTING SHOE DURING SHINING

Frank Ferrara, 659 East 187th St., Bronx, N.Y. 10458

Filed Dec. 7, 1981, Ser. No. 328,142

Int. Cl.³ A47L *23/02*

U.S. Cl. 15—34 **5 Claims**



1. A portable shoe shining machine comprising:

(a) an elongated housing having front and rear ends and sides;

(b) a shoe entry means on the front end for inserting the shoe into the housing;

(c) a shoe support means for supporting the shoe in a stationary manner in the housing, the elongated axis of the shoe substantially parallel to the elongated axis of the housing;

(d) a plurality of cylindrical rotating buffing brushes movable along the axis of the housing and surrounding and in contact with the sides and top of the shoe;

(e) means for moving the brushes back and forth along the length of the housing and simultaneously rotating the brushes;

(f) means for applying shoe polish to the brushes; and

(g) an interior shoe support means for insertion into the shoe for supporting the sides and top of the shoe during shoe shining, wherein the interior shoe support means is an inflatable bladder which is inflated to an effective pressure to support the sides and top of the shoe and to protect the inside of the shoe from polish.

4,441,226

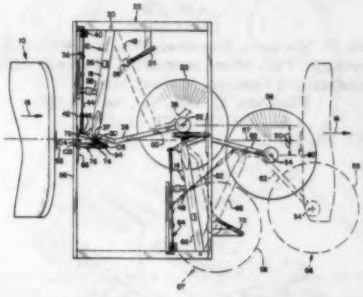
CAR WASHING APPARATUS

Daniel C. Hanna, 1133 SW. Rivington Dr., Portland, Oreg. 97201

Filed Aug. 2, 1982, Ser. No. 404,287

Int. Cl.³ B60S *3/06*

U.S. Cl. 15—53 AB **14 Claims**



1. Apparatus for detecting a predetermined location on the exterior of a car during the washing thereof, comprising:

a rotary brush,

means to rotate the brush,

control means to control the speed of brush rotation,

means to move the brush and car relative to each other,

support means to support and hold the brush rotating at a first speed against the exterior of the car while permitting relative movement of the brush and the car to move the brush along the exterior of the car,

detecting means to detect the predetermined location on the exterior of the car, and

means to actuate the control means to change the speed of brush rotation to a second speed as the brush encounters the predetermined location.

4,441,227

BRUSHES AND THE MANUFACTURE THEREOF

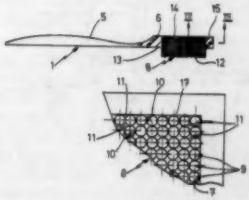
Etienne Y. d'Argembeau, 24 Rue de Belle-Vue, B-1050 Brussels, Belgium

Filed Mar. 10, 1982, Ser. No. 356,703

Claims priority, application Luxembourg, Mar. 18, 1981, 83225

Int. Cl.³ A46B *9/04*

U.S. Cl. 15—167 R **3 Claims**



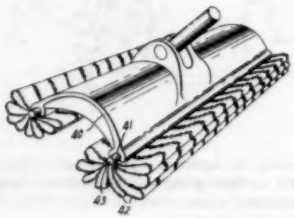
1. A brush comprising a handle and a head carrying protruding bristles made of an organic thermoplastic synthetic material, and wherein said head is provided with an aperture de-

fined by edges, through which aperture extends a first end of a plurality of monofilaments forming said bristles, said monofilaments being substantially tangent to each other all along their length so as to form between them a plurality of capillary channels which are open, on the one hand, at said first end of the filaments and, on the other hand, at the free or other end of the monofilaments, the latter being welded at said first end, to each other along their tangent contacting lines within said aperture as well as to the edges of said aperture, said first end of the filaments being substantially flush with a side of the head opposite to the side thereof from which the filaments protrude.

4,441,228
DUST MOP

Vernon W. Marquart, Hammond, Wis., and Walter W. Pawlikowski, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1982, Ser. No. 441,115
Int. Cl.³ A47L *13/252*
U.S. Cl. 15—229 BP **7 Claims**



1. A mop especially adapted for collecting and pushing dust and fine dirt on and from smooth surfaces, said mop comprising:

(a) a plurality of dusting elements, each dusting element comprising a substantially continuous elongate array of repeating segments of at least three dusting fabric ribbon loops;

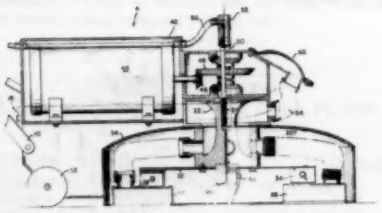
(b) a mop frame including a handle; and

(c) fastening means for securing said dusting elements in a side-by-side relationship to said mop frame.

4,441,229
ROTARY CLEANER-POLISHER

Clifford L. Monson, #280 1765 Ala Moana Blvd., Honolulu, Hi. 96815

Continuation-in-part of Ser. No. 251,118, Apr. 6, 1981, Pat. No. 4,339,840. This application Jun. 11, 1982, Ser. No. 387,705
Int. Cl.³ A47L *11/30, 11/292*
U.S. Cl. 15—322 **3 Claims**



1. A rotatable cleaning head for use in a carpet cleaner or the like comprising:

a hub member including a quick release means for securement to a hollow drive shaft including means for conducting a negative pressure air flow and a means for conducting fluid under positive pressure;

a plurality of radially outwardly extending resilient arms secured to the hub member and rotatable therewith;

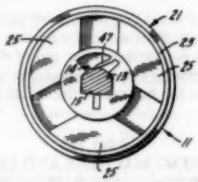
vacuum head means pivotably secured to each resilient arm member, said vacuum head means including a lower surface designed to be in contact with the surface to be cleaned and including a radially extending slot in fluid communication with the negative pressure airflow conducting means;

nozzle means in communication with the positive fluid flow conducting means whereby fluid may be sprayed upon the surface to be treated, and the vacuum head means, always in total surface contact, agitate the surface and extract the fluid.

4,441,230
MOLDED KNOB WITH RESILIENT FRICTION FIT FINGER

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Filed Feb. 5, 1982, Ser. No. 346,178
Int. Cl.³ F16D *1/06*
U.S. Cl. 16—121 **1 Claim**



1. A molded knob of the type which frictionally engages and slips over the end of a shaft of generally circular cross section with a curved outer surface and having at least one longitudinally extending flat surface,

a hub formed as part of the knob,

a shaft receiving walled socket formed in the hub,

said socket having a flat wall adapted to engage the shaft, said walls extending from the flat wall and positioned to contact the curved surface of the shaft, abutments located at the ends of the side walls distal from the flat wall and positioned to engage the shaft, and a curved wall located opposite to the flat wall, and

a resilient finger extending from the curved wall and having a tip with only the tip positioned to engage and apply pressure to the curved surface of the shaft, the resilient finger being located out of contact with the abutments, said resilient finger extends obliquely to the flat wall of the socket,

said abutments dimensioned to engage the shaft to limit deflection of the resilient finger beyond that necessary to apply a force to the shaft.

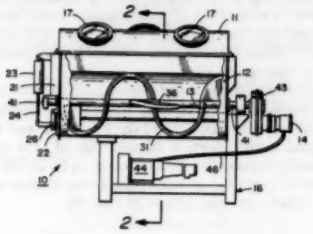
4,441,231
MASSAGER FOR LARGE MEAT SECTIONS

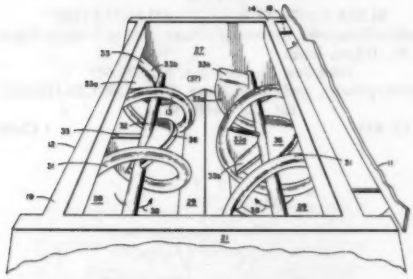
Valerio A. Baccetti, San Leandro, Calif., assignor to American Food Equipment Co., Hayward, Calif.

Filed Dec. 7, 1981, Ser. No. 328,206
Int. Cl.³ A22C *9/00*
U.S. Cl. 17—25 **9 Claims**

1. Apparatus for massaging meat in pieces containing large muscle sections comprising, a tub having at one end a product discharge, means serving selectively to open and to close said product discharge, a spaced apart pair of agitators including shafts extending longitudinally and mounted for rotation in said tub, drive means coupled to each shaft adjacent the end of said tub opposite from the discharge end and operative to drive

said pair of shafts in upward counter-rotation, each agitator including a ribbon extending about each shaft in a helix coaxially with such shaft, said helix being circular in transverse cross section and having a smooth peripheral surface, the ribbon on one shaft being spaced apart from the ribbon on the other shaft so that during rotation of such shafts the respective ribbons are not overlapped but are freely spaced from each other, the inside wall surfaces of such tub being curved to enshroud each said helical ribbon over a rotational angle greater than 180°, first and second baffles arranged on each shaft, said first baffle extending from said shaft to said ribbon and including a portion extending generally axially of said





shaft and another portion extending generally radially of said shaft, each shaft adjacent to the end walls of said tub being equipped with said first baffle, said second baffle being arranged on said shaft generally centrally along its length and extending generally axially of said shaft to project outwardly therefrom into a gap of the ribbon helix, said baffles and said ribbons serving to urge the meat product away from the sidewalls of said tub towards the medial portion of the tub in a motion wherein the product is urged upwardly to maximize the massaging action of the product pieces upon each other and to minimize and reduce pinching action of the product against the sidewalls of the tub.

4,441,232

METHOD AND APPARATUS FOR REMOVING A FIBER FRACTION FROM SEED COTTON

Gary L. Underbrink, Kingsville; Lambert H. Wilkes, College Station, both of Tex., and Joseph K. Jones, Raleigh, N.C., assignors to Cotton, Incorporated, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,845

Int. Cl.³ D01B *1/06*

U.S. Cl. 19—48 R **23 Claims**

1. Apparatus for removing a fiber fraction from seed cotton comprising:

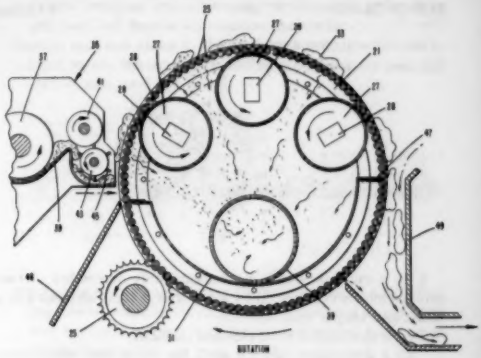
a plurality of closely spaced substantially parallel rollers, each of the rollers being freely rotatable about its axis;

means for driving said plurality of rollers in a continuous path substantially perpendicular to the axes of the rollers;

means for depositing seed cotton on a first side of the continuous path;

at least one relatively large diameter nip roll, a continuous outer peripheral surface portion of the nip roll being arranged in abutting engagement with the rollers on a second side of the continuous path opposite said first side, said at least one nip roll being fixed relative to the continuous path of the rollers;

suction means for drawing air from the first side to the



second side of the path of the rollers, said air aiding in extending a portion of the fiber fraction between adjacent ones of said rollers, said suction means drawing a substantially constant quantity of air substantially straight between the rollers in an area at least immediately upstream of the nip roll relative to the direction of movement of the continuous path; and

means for driving said at least one nip roll about an axis thereof for separating the fiber fraction extended between the rollers by the suction means from the seed.

4,441,233

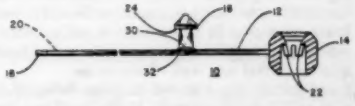
SECURITY SEAL WITH WEAKENED PORTION IN STUD

Allan W. Swift, Denville, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Jan. 31, 1983, Ser. No. 461,731

Int. Cl.³ B65D *63/10*

U.S. Cl. 24—16 PB **7 Claims**



7. A security seal formed of a single piece of molded plastic, comprising an elongated shackle, a first integral snap fastener portion formed at one end of the shackle, and a second integral snap fastener portion formed at a radial portion of the shackle spaced from both ends thereof, said snap fastener portion being shaped and dimensioned for locking non-removable engagement, the second snap fastener portion being spaced from the first snap fastener portion far enough to allow the portion of the shackle therebetween to be bent back on itself to enable the snap fastener portions to become engaged, the portion of the shackle extending from the second snap fastener portion away from the first snap fastener portion having an aperture at a distance from the second snap fastener portion such that said portion of the shackle may be passed through an aperture of a closure member to be sealed and then folded back on itself with one of said snap fastener portions being received in the aperture, said portion having the aperture being retained in assembly on said snap fastener portion by the assembled other snap fastener portion.

4,441,234

DECORATIVE CUFFLINK

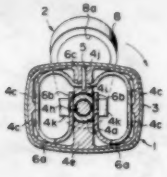
Hideo Kurashima, 5-12, Negishi 1-chome, Taito-ku, Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,172

Claims priority, application Japan, Apr. 10, 1982, 57-52487[U]

Int. Cl.³ A44B *5/02*

U.S. Cl. 24—41 **4 Claims**



1. In a cufflink which is disassemblably assembled of two sub-assemblies constituted by a decorative head element and a shank and keeper unit, wherein:

(a) the decorative head element includes:

(i) a decorative, oblong shell having a front wall and a perimetrical rearwardlyprojecting sidewall,

(ii) a body having a rear wall centrally provided with an axially-directed opening, the shell sidewall being perimetrically secured to the body to define within the decorative head element between said front wall, said rear wall and said sidewall an internal cavity;

(iii) a spectacles frame-shaped spring clip having a pair of laterally spaced, generally U-shaped legs having respective free end portions located nearest one another and having respective opposite ends joined by a rim; said rim in the vicinity of said free end portions having an arcuate bridge portion; all of said spring clip but for said bridge portion lying generally in a common plane, and said bridge portion, when free, extending at an acute angle which intersects said common plane where said bridge portion joins the remainder of said rim;

(iv) the body rear wall including means mounting said spring clip by the jamming of said bridge portion into a limited-thickness gap, this gap being capable of receiving said bridge portion only when said rim is resiliently torsionally stressed by an amount sufficient to cause said bridge portion to lie substantially in said common plane, whereby said spring clip is resiliently loaded against the interior of said rear wall of said body;

(v) said spring clip free end portions being juxtaposed with said hole for normally blanking-off two diametrically-opposed perimetrical segments of the hole;

(vi) a securement plate disposed within the cavity in line with said hole, said securement plate having a central, round-tipped projection formed thereon, which projection projects coaxially rearwardly within said hole so as to define an annular well between said projection and said body rear wall within said hole;

(b) the shank and keeper unit includes:

(i) a shank having a head end and a keeper end;

(ii) a keeper secured to the keeper end of the shank;

(iii) the head end having a convexly curved head provided with a diametrically-opposed pair of grooves which extend angularly of the shank, so that when the head end of the shank is thrust into the hole in the rear wall of the body of the decorative head element, the head first deflects the spring clip legs away from the rear wall and their free end portions laterally away from one another, until the free end portions snap into the respective said grooves in said shank head end as torsional stresses stored in said spring clip rim force the spring clip legs back against said rear wall of said body of said decorative head element;

(iv) said shank head end having means defining an axially-opening socket formed therein, which socket receives said projection as said shank head end is inserted through said hole into said annular well;

the improvement wherein:

said means mounting said spring clip includes:

a vertical rib integrally formed medially on said rear wall of said body in said cavity of said decorative head element, said hole opening laterally of said rib by intersection at two laterally spaced sites;

means defining a forwardly opening generally horizontal groove in said rib at an intermediate level between said hole and the perimeter of said rear wall and forming part of said limited-thickness gap for said bridge portion of said rim of said spring clip;

mechanical means received across said groove in front of said bridge portion of said rim of said spring clip for further forming said limited-thickness gap and for retaining said bridge portion of said rim of said spring clip resiliently torsionally stressed so as to lie in said common plane; and said securement plate being formed as an integral, relatively thin portion of said rib.

4,441,235

SLIDE FASTENER WITH BOTTOM STOP

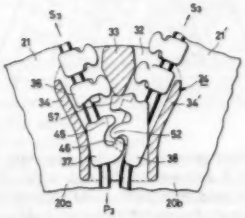
Masahiro Kusayama, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jan. 22, 1981, Ser. No. 227,469

Claims priority, application Japan, Feb. 1, 1980, 55-11182[U]

Int. Cl.³ A44B *19/36*

U.S. Cl. 433 **1 Claim**



1. A slide fastener, comprising:

(a) a pair of stringers having interlocking fastener elements carried on marginal beads thereof;

(b) a slider cooperable with said fastener elements to interlock and to disengage them in response to opposite directions of movement along said pair of stringers, said slider having a diamond disposed between a pair of flaring flanges; and

(c) a 3-piece bottom end stop including

(1) a first member mounted on a first of said beads and engageable with the lowermost fastener element on a second of said beads,

(2) a second member mounted on said first bead in spaced relation to said first member, and having spaced upper and lower protruberances extending obliquely upwardly towards said second bead, and

(3) a third member mounted on said second bead opposite to said second member, and having upper and lower tongues extending obliquely downwardly towards said first bead, said upper tongue being fixedly trapped between said first member and said upper protruberence and said lower tongue being fixedly trapped between said upper and lower protruberence, and said third member having a longitudinal edge facing that one of said slider flanges associated with said second bead, said edge having a first planar portion parallel to said second bead, said third member having an effective width taken at said first planar

portion exceeding the distance between said diamond and said one slider flange, said edge having a second planar portion disposed at an angle with respect to said second bead, said third member having a width at said second planar portion less than said distance, whereby said third member can be inserted into said slider only by first temporarliy distorting said second bead adjacent to said third member, whereupon after insertion said third member is movable to its normal non-bead-distorted position to place an end thereof into blocking position with respect to said diamond.

4,441,236

SAFETY LOCK

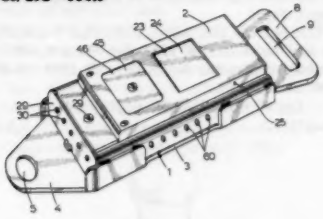
Jose Bron, Hemsterhuisstraat 159, 1065 JX Amsterdam, Netherlands

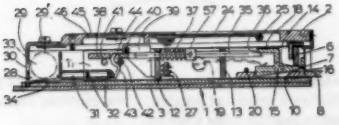
Filed Jan. 19, 1981, Ser. No. 226,534

Claims priority, application Netherlands, Jan. 18, 1980, 8000322

Int. Cl.³ A44B *11/25*

U.S. Cl. 292—336.3 **14 Claims**





1. A lock having a locking member displaceable between a locking position and a release position, characterized in that said lock is provided with a safety device for automatically unlocking the locking member upon a critical change of a given ambient condition, said device comprised of at least one usually unloaded feeler member responsive to a change of ambient condition and provided with a spring loaded unlocking element, movable from a retracted rest position to an operative position, said unlocking element displacing said locking member from said locking position to said release position, a catch member retaining said unlocking element in said rest position, said catch member co-acting with said feeler member and actuated by said feeler member in response to a change of condition to release said unlocking element thereby displacing said locking member.

4,441,237

INHOMOGENOUS ANISOTROPIC KINETIC ENERGY PENETRATORS

Chulho Kim, Alexandria, and Raymond J. Weimer, Burke, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1980, Ser. No. 132,462

Int. Cl.³ B21K *21/06*

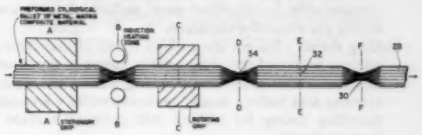
U.S. Cl. 29—1.2 **4 Claims**

1. A method of forming projectiles which comprises:

feeding a rod of fiber-reinforced composite material through a stationary gripper, through a heater region and a rotatable gripper such that the distance between the center of the heater region and the center of the rotatable gripper is equal to the length of one projectile to be formed; and the distance between the center of the heater region and the center of the stationary gripper is equal to the length of a second projectile to be formed;

activating said stationary gripper to hold said rod in place against rotation and activating the rotatable gripper to grip said rod therein for rotation therewith;

heating said rod along a desired length with the heat centered in the heater region and concentrated on said rod section until said rod is soft;



rotating said rotatable gripper through a desired number of degrees of rotation thereby rotating said rod along with said rotatable gripper and thereby deforming said rod in the heated region;

inactivating said heater to stop heating said rod, releasing the rod from the grip of said stationary and rotatable grippers, feeding the rod relative to said grippers and said heater zone for a distance sufficient to form two projectiles, and

repeating the cycle of heating, gripping, and rotating said rod in order to deform said rod in another desired length of said rod.

4,441,238

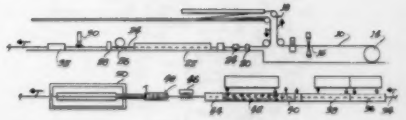
CONTINUOUS PRODUCTION OF POLISHED AND BUFFED TUBING

Humberto Hijuelos, East Hazelcrest; Giulio Scartozzi, Chicago Heights; Lawrence P. Vollmuth, Wheaton, and Raffaele Basile, Chicago Heights, all of Ill., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Feb. 9, 1981, Ser. No. 232,469

Int. Cl.³ B08B *9/02*; B21C *37/00*

U.S. Cl. 29—33 D **5 Claims**



1. Apparatus for continuously forming tubing from metal strip and providing a decorative finish thereto as it travels along a straight-line path including, in sequence,

means for continuously supplying metal strip,

forming rolls,

a seam welder,

scarfing means for treating said seam weld,

alkali wash means for cleaning the surface of said tubing,

means to prepare the surface of said tubing by exposing it to an acidic pickling solution,

rinse means to remove said pickling solution from the tubing,

means to dry said tubing and preheat the same,

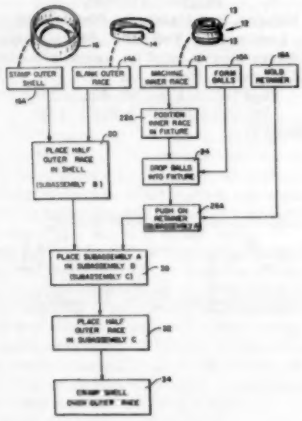
means for applying molten metal onto the surface of said formed tubing,
means to cool said tubing to solidify said molten metal,
a plurality of brushing means mounted adjacent the path of travel of said tubing at a location where said molten metal has solidified, said plurality of brushing means including a plurality of brushes mounted for tangential contact with said tubing and disposed around the path of said tubing to polish all portions of the surface of said tubing and a plurality of brushes mounted for radial contact with said tubing and disposed around the path of said tubing to polish all portions of the surface of said tubing, means to supply polishing abrasives to said rotating polishing brushes, and a means for rotating said polishing brushes in contact with the solidified metal surface of said traveling tubing for polishing the same,
buffing means adjacent the path of travel of said tubing for contact with said traveling tubing, means to continuously supply a fine abrasive to said buffing means, and means for rotating said buffing means circumferentially around said traveling tubing for buffing said polished surface to a lustrous finish,
cleaning means to clean polishing abrasives from the lustrous finish on said polished surface,
chromate passivating means for rendering the lustrous surface less chemically active,
means for applying a coating to said lustrous finish,
means for curing said coating, and
means for cutting said tubing into lengths.

4,441,239

METHOD FOR MANUFACTURE OF BEARINGS

Gerald H. Mullen, Burlington, Conn., assignor to Virginia Industries, Inc., Rocky Hill, Conn.

Division of Ser. No. 973,544, Dec. 26, 1978, Pat. No. 4,292,717.
This application Jul. 6, 1981, Ser. No. 280,930
Int. Cl.³ B21D *53/10*
U.S. Cl. 29—148.4 A **17 Claims**


STAMP OUTER SHELL
BLANK OUTER RACE
MACHINE INNER RACE
FORM BALLS
MOLD RETAINER
POSITION INNER RACE IN FIXTURE
PLACE HALF OUTER RACE IN SHELL (SUBASSEMBLY B)
DROP BALLS INTO FIXTURE
PUSH ON RETAINER
PLACE SUBASSEMBLY A IN SUBASSEMBLY B (SUBASSEMBLY C)
PLACE HALF OUTER RACE IN SUBASSEMBLY C
CRIMP SHELL OVER OUTER RACE

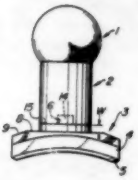
1. A method for the manufacture of a bearing comprising the steps of:
placing an inner raceway defining member in a fixture, the inner raceway defining member having an axis and a pair of spaced lands having a raceway defining groove therebetween, said lands extending outwardly from a body portion;
delivering balls to the fixture;
directing the balls downwardly about the outwardly facing end of an upper land on the inner raceway defining member and then directing the balls downwardly and inwardly toward the axis of the member to establish contact between the balls and a plurality of evenly spaced locations on the raceway surface between the lands;
impeding circumferential movement of the balls after contact with the raceway surface is established;
inserting a retainer over the balls to prevent radial movement thereof, the retainer engaging each of the balls and maintaining the circumferential spacing thereof;
positioning the subassembly comprising the retainer, balls, and inner raceway defining member in a first annular member which defines a first portion of the bearing outer raceway;
placing a second annular member which defines the remainder of the bearing outer raceway over the said subassembly; and
securing the annular members together.

4,441,240

METHOD OF PRODUCING CONNECTING ROD OF A RADIAL PISTON MOTOR

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Division of Ser. No. 165,328, Jul. 2, 1980, Pat. No. 4,376,393.
This application May 5, 1982, Ser. No. 375,166
Claims priority, application Japan, Dec. 28, 1979, 54-181683; Dec. 28, 1979, 54-181684
Int. Cl.³ B23P *15/00*; F16C *9/04*
U.S. Cl. 29—156.5 A **1 Claim**



1. A method of producing a connecting rod of a radial piston motor including a spherical portion, a rod portion, and a pad, said method comprising the steps of
forming a pad with a metallic backing layer separately from an attached spherical portion and rod portion and forming a large projection of diameter substantially equal to the diameter of said rod portion and a projection extending from said large projection on said backing layer and forming a recess in said rod portion opposite from where said spherical portion is attached for fitting on said projection,
forming a bearing alloy layer on a face of said pad on one side of said metallic backing layer away from said interfitting portion on said pad to form a composite pad,
interfitting said composite pad and said rod portions to each other by said projection and recess on each to form a joint between said rod portion and said pad,
and welding by electron beam welding at said joint of said rod portion and said pad for a short period of time with a local concentration of heat for deep weld penetration without degradation of said bearing alloy layer on the opposite side of said metallic backing layer.

4,441,241

METHOD OF MANUFACTURING A HEAT EXCHANGER UNIT

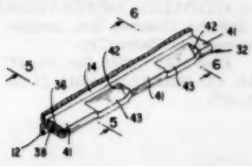
Russell W. Hoeffken, Belleville, Ill., assignor to Snyder General Corporation, Dallas, Tex.

Division of Ser. No. 178,338, Aug. 15, 1980, Pat. No. 4,298,061.
This application Aug. 21, 1981, Ser. No. 295,041
Int. Cl.³ B23P *15/26*; F24H *3/00*
U.S. Cl. 29—157.3 R **8 Claims**

1. A method of joining complementary sides of a heat ex-

changer unit, said heat exchanger unit comprising a pair of opposed sheet metal heat exchanger sides, each of said sides including a planar flange extending in a longitudinal plane when said sides are placed adjacent each other along said flanges, said method comprising:

placing said sides adjacent each other with the respective flanges of each side extending in said longitudinal plane and contiguous with each other;



folding the flange on one of said sides over the flange on the other of said sides; and

crimping said flanges together to form a plurality of first planar edge portions of both of said flanges spaced apart lengthwise along said flanges and extending in a first plane, and a plurality of second planar edge portions of both of said flanges extending between said first planar edge portions and extending in a second plane to securely clamp and seal said sides to each other.

4,441,242

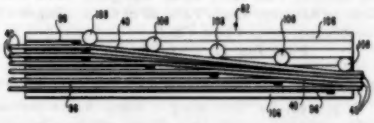
SPENT FUEL CONSOLIDATION SYSTEM

Michael G. Hicken, Murrysville; Fred Kirschensteiner, Forest Hills; Duane A. True, Pittsburgh, and Alexander Taleff, Churchill Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1981, Ser. No. 268,311

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—419 R **16 Claims**



1. Apparatus for remotely consolidating nuclear fuel rods comprising:

row ordering means arranged to simultaneously accept a plurality of nuclear fuel rods for rearranging said fuel rods into a different configuration without damaging said fuel rods;

first consolidation means associated with said row ordering means for simultaneously compacting individual rows of said fuel rods without damaging said fuel rods; and

second consolidation means associated with said row ordering means for simultaneously compacting a plurality of said fuel rods without damaging said fuel rods.

4,441,243

CAMSHAFT BEARING AND METHOD FOR MOUNTING THE CAMSHAFT

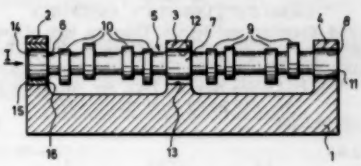
Dieter Stojek, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 1, 1982, Ser. No. 394,391

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126280

Int. Cl.³ B23P *19/04*; F16C *33/04*

U.S. Cl. 29—433 **3 Claims**



1. A camshaft mounting for a one-piece camshaft supported in three undivided bearing blocks of a cylinder head, in which the bearing bore in a bearing block at one end of the camshaft has a diameter which corresponds to the diameter of a bearing portion on the camshaft, the middle bearing block has a bore of which the diameter corresponds to the diameter of a middle bearing portion of the camshaft and an additional cut-out longitudinal groove on the unloaded side of the bearing shaped to permit passage of the cams of the camshaft during assembly, and the bearing block at the other end of the camshaft has a diameter sufficiently large to envelope all the cam vertices.

4,441,244

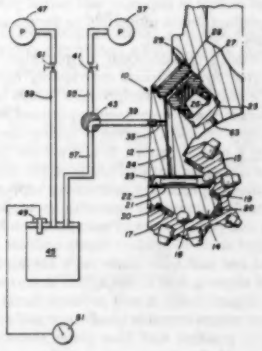
SEALED BEARING ROTARY ROCK BIT ASSEMBLY

George A. Cason, Jr., Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 29, 1981, Ser. No. 316,179

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—434 **4 Claims**



1. A method of manufacturing a sealed bearing rotary rock bit comprising the steps of:

assembling a seal and cone on a bearing pin of a rock bit arm;

locking the cone and pin together with a retaining means so that the cone may rotate about the axis of the pin on cooperating engaging bearing structure forming a sealed bearing system;

evacuating gases from said sealed bearing system to an initial pressure;

evacuating a vacuum chamber to a pressure lower than said

initial pressure and measuring the relative humidity therein to define an initial relative humidity;

ducting said sealed bearing system to said vacuum chamber to evacuate additional gases from said system into said chamber and measuring the relative humidity of gases therein to define a resultant relative humidity; and

injecting lubricant into said bearing system upon said resultant relative humidity being at or less than a maximum accepted value greater than said initial relative humidity.

4,441,245

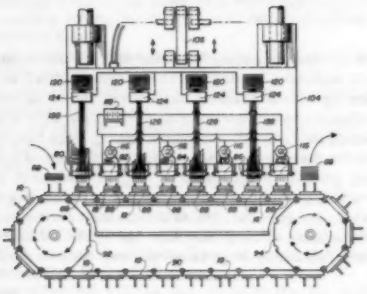
GANG CUTTING TOOL ASSEMBLY

Henry M. Thornton, and John S. Thornton, both of York, Pa., assignors to Ashcombe Products Company, Dover, Pa.

Division of Ser. No. 231,340, Feb. 4, 1981, Pat. No. 4,397,074. This application Nov. 26, 1982, Ser. No. 444,672

Int. Cl.³ B23Q *3/00*; B23B *39/18*

U.S. Cl. 29—564 **1 Claim**



1. Mechanism for drilling in one or a stack of a limited number of similar product sheets a pattern of holes comprising:

(a) a frame supporting along a path a plurality of vertically reciprocable heads each adapted respectively to mount a support plate and the plurality of plates respectively having partial patterns of powered tool heads comprising a set thereof to drill in sequence said partial patterns of holes in said product sheets ultimately to form a complete pattern of holes in each sheet,

(b) a plurality of additional reciprocably mounted heads supported by said frame individually between each successive pair of said reciprocable heads having powered tool heads thereon and said additional heads having respectively attached thereto a testing support plate each having a partial pattern of test probes corresponding to the partial pattern of tool heads on the reciprocable heads immediately preceding said testing support plates,

(c) an endless conveyor operable to support and convey along said path a series of base plates each holding one or a limited stack of product sheets uniform in number to be drilled and said base plates each having identically positioned aligning pins for reception in corresponding identically aligned holes in said product sheets,

(d) power means operable to advance said conveyor sequentially to position said base plates stepwise beneath said reciprocable heads supporting said powered tool heads to effect the drilling of said partial patterns of holes respectively in said single or limited stacks of product sheets and subsequently position said progressively drilled product sheets sequentially beneath said reciprocable heads to which said testing support heads and probes are connected to test the drilling of said holes for completeness,

(e) indicating means associated respectively with said testing support heads operable to produce a signal in the event unsatisfactory drilling of said product sheets has occurred, and

(f) said support plates further including spring-pressed pads yieldable upwardly and adapted to facilitate withdrawal of drills from said product sheets by pressing said sheets against said support plates while drills and/or test probes are being withdrawn from said sheets to maintain said sheets in accurate position upon said base plates, and also keep them flat.

4,441,246

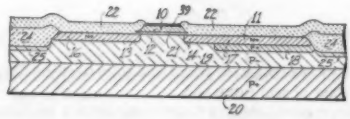
METHOD OF MAKING MEMORY CELL BY SELECTIVE OXIDATION OF POLYSILICON

Donald J. Redwine, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 7, 1980, Ser. No. 147,433

Int. Cl.³ B01J *17/00*; H01L *27/04, 21/306*

U.S. Cl. 29—571 **14 Claims**



1. A method of making a dynamic semiconductor memory cell of the one-transistor type comprising the steps of:

forming a first doped region in a face of a body of semiconductor material to provide part of a capacitor,

applying a layer of polycrystalline silicon doped with impurity on said face overlying the first doped region and overlying a channel region in the face but separated therefrom by thin insulator,

applying an oxidation mask over said layer of polycrystalline silicon over said channel region but not over said first doped region,

subjecting said face to a thermal oxidation atmosphere to oxidize said polycrystalline silicon and to cause impurity doping of the face beneath the layer of polycrystalline silicon but not in said channel region, thereby creating source and drain regions for a transistor and another part of said capacitor overlying said first doped region, the polycrystalline silicon beneath the oxidation mask remaining relatively unoxidized by said atmosphere, and

applying conductive means to the face making electrical connection to a gate area of the unoxidized polycrystalline silicon over said channel region.

4,441,247

METHOD OF MAKING MOS DEVICE BY FORMING SELF-ALIGNED POLYSILICON AND TUNGSTEN COMPOSITE GATE

Paolo Gargini, Palo Alto; Israel Beinglass, Santa Clara, and Norman Ahlquist, Menlo Park, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 29, 1981, Ser. No. 278,656

Int. Cl.³ H01L *29/72, 21/26*

U.S. Cl. 29—571 **21 Claims**

1. A process for fabricating a metal-oxide-semiconductor (MOS) integrated circuit on a silicon substrate including the steps of:

growing a first oxide on said substrate;

forming a polysilicon layer over said first oxide layer;

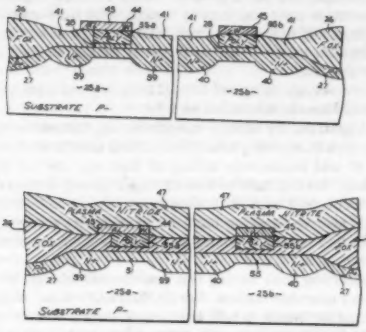
forming a silicon nitride layer over said polysilicon layer;

defining a plurality of circuit members from said polysilicon layer employing masking members formed from said silicon nitride layer;

forming a plurality of source and drain regions in said substrate in alignment with at least some of said circuit members;

growing a second oxide layer on said substrate, said silicon nitride members preventing growth of oxide on said circuit members;

removing said silicon nitride members;
forming metal members on said polysilicon circuit members, said metal members for increasing the conductivity of said circuit members;
covering said substrate with a protective layer, said layer



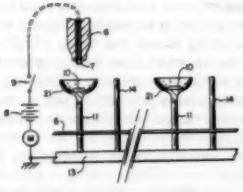
being processed at a sufficiently low temperature to prevent deterioration of said metal members; and,
forming metal interconnections and contacts over said protective layer, to interconnect at least some of said circuit whereby low resistance polysilicon/metal buried contact members are formed in an MOS circuit.

4,441,248

ON-LINE INSPECTION METHOD AND SYSTEM FOR BONDS MADE TO ELECTRONIC COMPONENTS

Rand C. Sherman, Columbus, and Van E. Wood, Delaware, both of Ohio, assignors to Stanley Electric Company, Ltd., Yokahama, Japan

Filed Dec. 2, 1982, Ser. No. 446,174
Int. Cl.³ H01L *49/00*
U.S. Cl. 29—574 **9 Claims**



1. A method of making on-line inspection of electric characteristics of a semiconductor device during a step of bonding a lead wire to a chip surface of said semiconductor device in the process of fabricating an electronic component, comprising:
applying an electric power across said lead wire which is to be bonded to said chip, and bonded to connectors which serve as electric terminals when said semiconductor device is assembled into an electronic component.

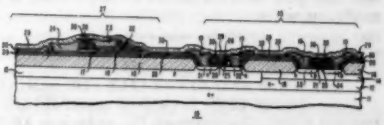
6. A system for making on-line inspection of electric characteristics of a semiconductor device during a step of bonding a lead wire to a chip surface of said semiconductor device in the process of fabricating an electronic component, comprising:
a. an electroconductive base means;
b. an electroconductive cathode connector means projecting from one surface of said base means and carrying, at its free end, a reflector means securely receiving a semiconductor chip bearing on its surface an ohmic contact metal electrode;
c. an electroconductive anode connector means projecting from a surface of the base mans adjacent to said cathode connector means and forming a pair therewith;
d. a capillary means movably positionable above said cathode connector means and said chip and positionable over said anode connector means for feeding a lead wire to be bonded to said connector means; and
e. an electric circuit means formed between said base means and said lead wire via said capillary means and connected to a power supply and having an on/off switching means for applying and cutting an electric power across said lead wire and said base means.

4,441,249

SEMICONDUCTOR INTEGRATED CIRCUIT CAPACITOR

Joshua Alspector, Westfield; Eliezer Kinsbron, Highland Park, both of N.J., and Marek A. Sternheim, Livermore, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 26, 1982, Ser. No. 382,403
Int. Cl.³ H01L *21/70*
U.S. Cl. 29—577 C **10 Claims**



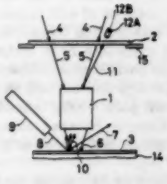
1. The method of making a polyoxide capacitor in a silicon semiconductor integrated circuit comprising forming an insulating layer on a surface of a silicon semiconductor body, depositing on a portion of the insulating layer a first polysilicon layer by a pyrolytic process at a temperature in the range from 570 degrees C. to about 595 degrees C., which includes the addition of a conductivity-enhancing element, heating the semiconductor body in the presence of oxygen to grow on the surface of the first polysilicon layer an intermediate layer of silicon oxide, depositing upon at least a portion of the intermediate layer of oxide a second layer of conductive polysilicon, and providing electrical contacts to the first and second polysilicon layers.

4,441,250

APPARATUS FOR REGISTERING A MASK PATTERN IN A PHOTO-ETCHING APPARATUS FOR SEMICONDUCTOR DEVICES

Issei Imahashi, Yamanashi, Japan, assignor to Telmec Co., Ltd., Nirasaki, Japan

Division of Ser. No. 213,960, Dec. 8, 1980, Pat. No. 4,377,028.
This application Jan. 28, 1983, Ser. No. 461,694
Claims priority, application Japan, Feb. 29, 1980, 55-25007
Int. Cl.³ H01L *21/68, 21/312*
U.S. Cl. 29—578 **5 Claims**



1. An apparatus for registering a pattern on a mask plate with a pattern already formed on a semiconductor wafer; characterized in that said apparatus comprises means for holding said semiconductor wafer, means for holding said mask plate, an optical system including a lens for focusing an image of the pattern of said mask plate on said semiconductor wafer, a light source for irradiating a wafer held by said wafer holding

means, said mask plate having a plurality of windows having a predetermined shape, aligned at a predetermined pitch along a predetermined direction, said wafer having a plurality of reflectors of a predetermined shape aligned at a predetermined pitch along a predetermined direction, one of said windows and said reflectors being directed into first and second groups, said first and second groups being provided with a staggered phase relationship equal to a multiple of one half of said predetermined pitch, means for moving one of said wafer and said mask plate relative to the other, and first and second photo-sensitive means adapted to receive light emitted from said light source, reflected by reflectors formed on said semiconductor wafer and passed through said windows formed on said mask plate, said first photo-sensitive means being responsive to light received from said first group and said second photo-sensitive means being responsive to light received from said second group, whereby the relative position of said wafer and said mask plate are determined when the detected quantities of light received by said first and second photo-sensitive means take a predetermined proportion to thereby register the pattern on said mask plate with the pattern already formed on said semiconductor wafer.

4,441,251

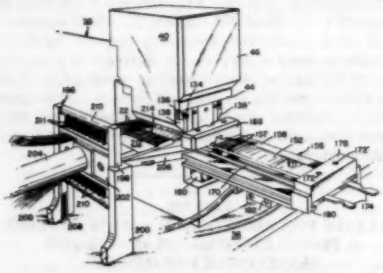
METHOD AND APPARATUS FOR SERIALLY PRODUCING HARNESS ASSEMBLIES

Daniel B. Grubb, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 157,692, Jun. 9, 1980, abandoned. This application Jun. 22, 1982, Ser. No. 391,025

Int. Cl.³ H01P *43/04*; B23R *23/00*

U.S. Cl. 29—861 **21 Claims**



1. A method of serially manufacturing electrical harness assemblies of the type comprising a first and second electrical connector, each of said connectors having two parallel rows of contact terminals therein, each of said terminals having a wire-receiving portion, said wire-receiving portions of said two rows facing in opposite directions, and wires extending between said connectors, the ends of said wires being received in said wire-receiving portions of said terminals in said first and second connectors, said method comprising the steps of:

(1) feeding wires extending from endless sources along a feed path in two parallel spaced-apart planes which feed path extends through and beyond an insertion zone with the wires in each plane being spaced apart by distances equal to the distance between adjacent wire-receiving portions of terminals in the rows of terminals in said connectors,

(2) positioning a first and a second connector in said insertion zone between said planes with the wire-receiving portions of said terminals in said first and second connectors in alignment with each other and in alignment with the wires in said two planes and with said second connector being downstream, relative to the direction of wire feed along said path, from said first connector,

(3) moving said wires in said two planes laterally of their axes, towards said connectors and into said wire-receiving portions of said terminals and severing said wires at locations between said first and second connectors,

(4) removing the second connector with wires extending beyond said insertion zone,

(5) moving said first connector along said path completely through, and for a predetermined distance beyond, said insertion zone and thereby feeding wire from said sources along said feed path towards said insertion zone, maintaining said wires in said two planes during feeding of said wires, and

repetitively carrying out steps (2), (3), (4), and (5) to produce said harness assemblies serially.

4. Apparatus for serially manufacturing harness assemblies of the type comprising a first and second electrical connector, each of said connectors having at least one row of contact terminals therein, each of said terminals having a wire-receiving portion, and wires extending between said connectors, the ends of said wires being received in said wire-receiving portions of said terminals in said first and second connectors, said apparatus comprising:

an insertion zone having first and second side-by-side adjacent insertion stations therein, first and second connector locating means at said first and second insertion stations for locating a first connector and a second connector at said stations in parallel aligned relationship with said wire-receiving portions of said terminals in said first and second connectors in alignment,

wire positioning and retaining means in said insertion zone, said wire positioning and retaining means being effective to locate a plurality of wires in a common plane with the axes of said wires in alignment with said wire-receiving portions of said terminals in said first and second connectors in said first and second connector locating means, said wire positioning and retaining means being effective releasably to retain said wires until said wires are moved towards said first and second connector locating means,

wire guide means for guiding wires which extend from substantially endless sources of wire to said wire positioning and retaining means,

first and second insertion tooling means, each of said insertion tooling means comprising inserters which are normally spaced from said first and second locating means, said inserters being movable relatively towards said connector locating means and being effective during movement to move wires from said positioning and retaining means towards said connector locating means and into said wire receiving portions of said terminals, and,

severing means in said insertion zone between said first and second insertion tooling means for severing said wires at locations between said connector locating means whereby,

said harness assemblies are produced serially by feeding wires extending from the endless sources of wire along a wire feed path which extends through said guide means to said insertion zone, locating said wires in said wire positioning and retaining means, placing connectors in said locating means in said first and second insertion. stations, moving said inserters towards said connectors, severing said wires by means of said severing means, removing said second connector from said apparatus, moving said first connector and the wires connected thereto through and beyond said insertion zone and thereby withdrawing wire from said endless sources of wire, and repeating the foregoing steps.

4,441,252

HAIR TRIMMING DEVICES

Thomas J. Caves, 223 Island Way, Clearwater, Fla. 33515

Filed Jun. 21, 1982, Ser. No. 390,278

Int. Cl.³ B26B *21/12*

U.S. Cl. 30—30 **3 Claims**

1. A hair trimming device, comprising,

a double-edged razor blade means,

a base plate member of rectangular configuration having a

length corresponding to the length of said razor blade means, said base plate member having an outer surface and an inner surface,

a pair of longitudinally spaced, longitudinally aligned upstanding peg members disposed coincident with the longitudinal axis of symmetry of said base plate member, on the inner surface thereof,

said peg members in registration with associated openings formed astride the longitudinal axis of symmetry of said razor blade means when said razor blade means is disposed atop said inner surface of said base plate means,

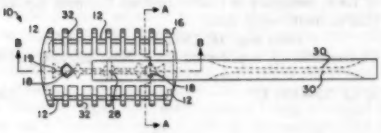
a base plate capping member corresponding in configuration and dimension to said base plate member, said base plate capping member having an inner surface and an outer surface,

said base plate capping member having peg-receiving recesses formed in said inner surface, said recesses disposed in registration with said peg members to releasably receive the same when said base plate member and said base plate capping member are disposed in sandwiching relation to said razor blade means,

an elongate handle member,

said handle member terminating in a yoke means,

said yoke means including a pair of transversely spaced, substantially parallel arm members,



a notch-like recess formed in each of said arm members in transversely spaced relation to one another for releasably retaining said base plate member and said base plate capping member in abutting relation to one another when the device is in use,

a longitudinally aligned slot means formed on the respective outer surfaces of said base plate member and said base plate capping member, said slot means adapted to slidingly receive opposed, inwardly facing surfaces of said arm members,

an outwardly projecting ridge-like means formed in the outwardly facing respective surfaces of said slot means to engage said notch-like recess of said arm members,

a plurality of transversely aligned, longitudinally spaced cut away portions formed in the respective transverse edges of said base plate and base plate capping members to expose the transverse edges of said razor blade means to the hair to be cut,

the depths of the transversely opposite cut away portions being different so that a first edge of said razor blade means is employed to cut hair at a first length, and so that a second edge of said razor blade means is employed to cut hair at a second length.

4,441,253

TWO CYCLE SAFETY RAZOR

Charles H. Sacks, 18100 N. Atlantic Blvd., North Miami Beach, Fla. 33160

Filed May 19, 1983, Ser. No. 496,282
Int. Cl.³ B26B *21/00*
U.S. Cl. 30—32 **1 Claim**

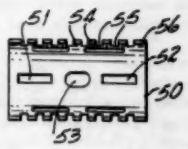
1. A safety razor comprising in combination

(a) a platform having its length greater than its width, said platform having a series of alternating slots and teeth along the edges of its longer sides, the width of each of said teeth being equal to the width of each of said slots;

(b) a cover plate substantially the same size as said platform to cooperate with said platform, having horizontal guides and a center screw;

(c) a razor blade substantially the same size as said platform to cooperate with said platform and said cover plate;

(d) an elongated handle to receive said center screw, releasably connecting to said platform, said razor blade and said cover plate;



(e) a means to manually shift said razor blade a length of one of said teeth relative to said platform, exposing said lengths of said razor blade's edge previously unused, and the previously used lengths covered by said teeth of said platform; and

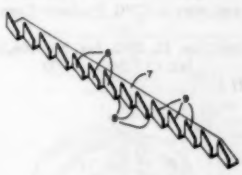
(f) said means to shift said razor blade relative to said platform includes an oblong center opening in said platform having its larger diameter equal to the diameter of said center screw plus the width of one of said teeth of said platform, whereby said razor assembly is loosened such that said platform is shifted relative to said center screw.

4,441,254

KITCHEN UTENSIL FOR CUTTING FRUIT, VEGETABLES AND THE LIKE INTO STRIPS AND A BLADE THEREFOR

Alfred Börner, Industriegebiet, 5561 Landscheid-Niederkail, Fed. Rep. of Germany

Filed Jun. 5, 1981, Ser. No. 271,009
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3022021
Int. Cl.³ B26B *3/04*
U.S. Cl. 30—124 **7 Claims**



1. A blade member for a utensil for cutting foodstuffs, comprising:

(a) a generally rectangular strip of metal which is sharpened along one longitudinally extending edge and which has a portion adapted to form a base for a plurality of cutting blades;

(b) a plurality of parallel slits which extend from said sharpened edge transversely to the length of said strip; and

(c) a plurality of spaced cutting blades lying at right angles to the plane of said base portion of the strip of metal and transversely to the length of the strip, each blade of said plurality of cutting blades being constituted by a portion of said generally rectangular strip of metal located adjacent to the sharpened edge of the strip and between adjacent slits, the metal of each blade merging with said base portion of the strip along a line which intersects one of the adjacent slits intermediate the length thereof and the other

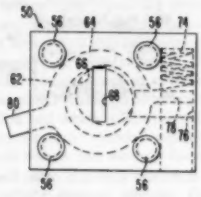
of said adjacent slits at an end thereof remote from said sharpened edge, each blade having its greatest height nearer to one end of the blade than to the other.

4,441,255

HOLDER FOR SABER SAW BLADE

Simon J. Hoffman, P.O. Box 75821, Los Angeles, Calif. 90075

Division of Ser. No. 62,606, Aug. 1, 1979, Pat. No. 4,285,129.
This application Feb. 2, 1981, Ser. No. 230,966
Int. Cl.³ B27B *19/09*
U.S. Cl. 30—392 1 Claim



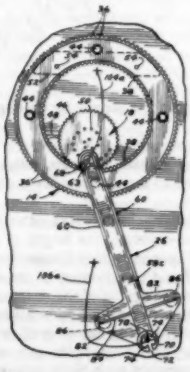
1. A holder for a saber blade comprising: a support having means defining a recess for receiving one end of a saber saw blade; and means shiftably mounted on the support for releasably holding the saber saw blade in the recess, the holding means including spring structure biasing the holding means into a blade holding position, the blade having a notch extending into the same from one marginal edge thereof, said support having a slot defining said recess, said support including a main body and a plate spaced forwardly from the body to form a gap, the body and the plate having aligned, respective slots therein defining said recess, said holding means including a cam member rotatably mounted in the gap and having an eccentric cam portion movable into an operative position in alignment with the slots in the body and the plate and thereby into the notch when the blade is in the slots, said spring structure biasing the cam portion into said operative position.

4,441,256

MANIPULATOR FOR CREATING A MULTIPLICITY OF VARIED LINE DESIGNS

Charles A. Cummings, and William R. La Dow, both of Cincinnati, Ohio, assignors to CPG Products Corp., Minneapolis, Minn.

Filed Nov. 23, 1982, Ser. No. 444,262
Int. Cl.³ B43L *11/00*
U.S. Cl. 33—27 L 15 Claims



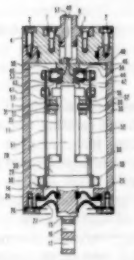
1. A manipulator for creating primary and secondary line designs comprising master means including first and second members for guiding a first marking implement to form said primary design, said first member being provided with an inner edge having a relatively large radius of curvature and said second member being provided with an outer edge having a relatively small radius of curvature and said second member having a plurality of holes at different distances from its said outer edge, said inner and outer edges being engageable with each other, and slave means controlled by said master means for guiding a second marking implement to form said secondary design, said slave means including an elongated cam arm having a hole near one end thereof registrable with a selected one of the plurality of holes in said second member so that one end of said first marking implement can be received in the hole of said cam arm and in the selected hole of said second member to interconnect said cam arm with said second member so that said cam arm is controlled through the agency of said one end of said first marking implement.

4,441,257

PROBE FOR CHECKING LINEAR DIMENSIONS

Guido Golinelli, Bologna, and Narciso Selleri, Monteveglio, both of Italy, assignors to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Sep. 16, 1982, Ser. No. 418,628
Claims priority, application Italy, Nov. 20, 1981, 3579 A/81
Int. Cl.³ G01B *7/02*
U.S. Cl. 33—174 L 10 Claims

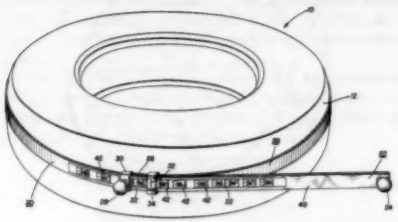


1. A probe for checking linear dimensions, like dimensions of mechanical pieces, including support means, an arm movable with respect to the support means and having a portion defining a longitudinal geometrical axis, connection means for connecting the arm to the support means for allowing the arm to displace with respect to the support means in two opposite directions, feeler means for touching the surface of the piece to be checked, coupled to an end of the movable arm, and switch means with electrical contacts, that are closed in rest condition, associated with the arm and the support means, wherein said switch means comprise two flexible laminae with a first end coupled to the movable arm and a second end free; a control device coupled to the movable arm including first reference surfaces; and second reference surfaces coupled to the laminae; said electrical contacts including two movable contacts fixed to the laminae next to the free ends of the laminae and to the second reference surfaces and corresponding fixed contacts fastened to the support means; said first reference surfaces being adapted for cooperating, further to the displacements of the movable arm from a rest position, with the second reference surfaces, for resiliently deflecting either of the laminae and separating either of the movable electrical contacts from the corresponding fixed contact.

4,441,258
CODED TAPE FOR DETERMINING TIRE SIZE

Charles R. McDaniel, Wadsworth, Ohio, and H. Richard Baumgardner, Prospect, Ky., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 5, 1983, Ser. No. 510,697
Int. Cl.³ G01B 3/10
U.S. Cl. 33—179 10 Claims

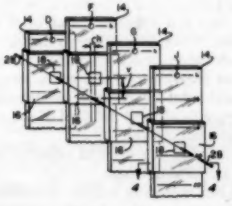


1. A measuring device for a tire, said device comprising a length of flexible tape having two ends and being adapted to circumferentially surround and overlap an annular portion of the outer peripheral surface of a tire, said device including means for adjusting said tape to said annular portion, the improvement comprising a plurality of transversely extending discrete bands located adjacent to one end of an outer surface of said tape, each of said discrete bands having an individual code marked thereon, each of said codes comprising an individual matrix code corresponding to a physical dimension of one of a plurality of matrices or molds used in the curing of new or retreaded tires, said matrix codes being arranged on said tape such that said codes represent decreasing mold dimensions in a direction away from said one end, said bands and said codes together comprising means for determining the appropriate matrix or mold in which a tire is to be positioned for curing by direct visual inspection of said tape when said tape surrounds said annular portion.

4,441,259
METHOD, AND MEANS, FOR IN SITU DETERMINATION OF ALIGNMENT OF A VEHICLE FRAME

Alfred Leitermann, 4 Lakewood Pl., Port Monmouth, N.J. 07758, and Gary B. Mason, 2164 Holly Hill Rd., Lakehurst, N.J. 08733

Filed Jan. 26, 1982, Ser. No. 342,825
Int. Cl.³ G01B 5/25
U.S. Cl. 33—288 10 Claims



1. A method for in situ determination of alignment of a vehicle frame, which frame has a reference line and datum points, comprising the steps of:

attaching sighting targets to a plurality of at least three of the vehicle frame datum points at standardly-prescribed distances, for each of the sighting targets, from the vehicle frame reference line; and

taking a linear sighting, with sighting means which is (a) wholly independent of, (b) universally-movable in isolation from, and (c) freely emplaceable in a selected adjacency to said vehicle frame, along said targets to ascertain alignment and misalignment of any one of said targets relative to at least two others thereof; wherein

said attaching step comprises attaching sighting targets which are, at least in part, substantially planar;

said linear sighting step comprises taking a linear sighting along said targets, as aforesaid, which is perpendicular to said targets;

said attaching step further comprises attaching sighting targets which have alignment-tolerance frames visible thereon;

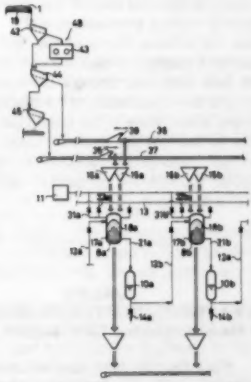
said linear sighting step further comprises moving said sighting means until linear sighting thereby establishes linear alignment of said frames of said two other targets; and

said attaching step further comprises attaching to said datum points translucent, dimensionally-graduated scales which have the aforesaid alignment-tolerance frames movable thereon.

4,441,260
PROCESS AND APPARATUS FOR DEHYDRATING ORGANIC SOLID MATERIAL

Yasuyuki Nakabayashi, Yokohama; Yoshio Matsura, Funabashi; Michio Kurihara, Mitaka; Takao Kamei, Ashiya; Akira Nakamura, Akashi; Keiichi Komai, Akashi; Akira Simotamari, Akashi, and Izumi Matsuno, Kobe, all of Japan, assignors to Electric Power Development Co. Ltd., Tokyo and Kawasaki Jukogyo Kabushiki Kaisha, Kobe, both of, Japan

Filed Jan. 28, 1982, Ser. No. 343,771
Int. Cl.³ F26B 3/04
U.S. Cl. 34—15 4 Claims

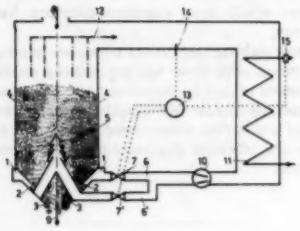


1. In a process for dehydrating water-containing organic solid material comprising the steps of introducing the material into a pressure vessel, applying saturated steam to said vessel to heat the material so that water in the material is removed and mixed with condensate of the steam to be exhausted from the vessel as a waste water, the improvement comprising classifying the solid material into a first group of relatively larger size particles and a second group of relatively smaller size particles, charging the first group of relatively larger size particles into the pressure vessel so that a bottom portion of the vessel is composed of a layer of relatively larger size particles, then changing the second group of relatively smaller size particles on the layer of relatively larger size particles.

4,441,261
METHOD AND APPARATUS FOR COOLING HOT BULK MATERIAL

Georg Beckmann, Vienna, Austria, assignor to Waagner Biro Aktiengesellschaft, Austria

Filed Jun. 1, 1981, Ser. No. 268,828
Claims priority, application Austria, Jun. 6, 1980, 2983/80; Jun. 6, 1980, 2984/80
Int. Cl.³ F26B *3/14, 21/06*
U.S. Cl. 34—20 **16 Claims**



1. A method of cooling hot bulk material in a cooling bunker comprising the steps of:

passing a first cooling gas stream from a first feed line through a core zone of the hot bulk material within the bunker;

simultaneously passing a second cooling gas stream from a second feed line through a peripheral zone of the hot bulk material within the bunker;

collecting the heated first and second gas streams after the same have passed through the hot bulk material and directing the heated gas stream from the cooling bunker into gas cooling apparatus and recooling the same therein;

directing the recooled gas stream from the gas cooling apparatus into the first and second feed lines to form the first and second cooling gas streams; and

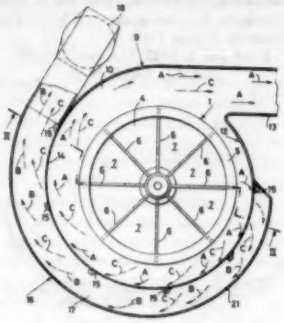
regulating the relative flows of the first and second gas streams with respect to each other through the first and second feed lines and through the hot bulk material in response to the temperature of the heated gas stream such that as the temperature of the heated gas stream increases, the flow of the first gas stream through the core zone of the hot bulk material is reduced and the flow of the second gas stream through the peripheral zone of the hot bulk material is increased.

4,441,262
DRIER, PARTICULARLY FOR PLASTIC MATERIAL

Domenico Gazzoni, Breccia, Italy, assignor to Sorema s.r.l., Italy

Filed Dec. 15, 1981, Ser. No. 330,852
Claims priority, application Italy, Mar. 17, 1981, 20371 A/81
Int. Cl.³ F26B *17/10*
U.S. Cl. 34—57 D **4 Claims**

1. Drier, particularly for plastic material, comprising a rotor rotating about a vertical axis means for directing wet material to be dried onto the rotor from above and means for rotating said rotor so as to centrifuge said material outwardly together with conveyance air generated by the rotor, a first scroll around said rotor to receive and convey towards an outlet said material and said conveyance air, a bored grating arranged in a lateral wall portion of said first scroll in such a position as to receive the impact of the material centrifugated by the rotor and to allow the outflow of a part of said conveyance air and of the liquid which separates from said material because of said impact and the crossing of the material by said conveyance air, and a second scroll which develops around said portion of the

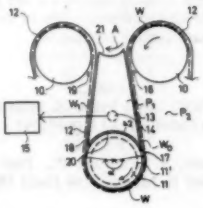


first one to receive and convey towards a discharge said conveyance air and said liquid passed through the grating.

4,441,263
DEVICE IN THE DRYING SECTION OF A PAPER MACHINE

Timo Vedenpää, Jyväskylä, Finland, assignor to Valmet Oy, Finland

PCT No. PCT/FI80/00002, 371 Date Jul. 20, 1981, 102(e) Date Jun. 18, 1981, PCT Pub. No. WO81/01428, PCT Pub. Date May 28, 1981
PCT Filed Oct. 27, 1980, Ser. No. 276,334
Claims priority, application Finland, Nov. 20, 1979, 793643
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—115 **6 Claims**



1. In a drying section of a paper machine including drying cylinders and a drying fabric loop arranged such that a first group of at least one of said cylinders is located outside of said drying fabric loop and a second group of at least one of said cylinders is located within said drying fabric loop, so that the web runs in a closed draw in a joint run with and supported by said fabric from a cylinder of one group to a cylinder of the other group, said joint run defining wedge-shaped spaces between said drying fabric and the shell of the drying cylinders, the improvement comprising

at least one suction box situated adjacent to a joint run of said web and drying fabric,

said suction box including suction apertures situated proximate to at least one of said wedge-shaped spaces to produce a suction effect mainly in said at least one of said wedge-shaped spaces,

said at least one suction box thereby constituting means for producing a suction effect mainly in at least one of said wedge-shaped spaces,

said suction effect being substantially higher than a suction effect, if any, produced by said suction box in the region of said closed draw run of said web between said wedge-shaped spaces,

wherein said at least one suction box includes a substantially closed, planar wall, situated adjacent to said closed draw run of said web between said wedge-shaped spaces,

wherein longitudinal seals are provided at each lateral side of said suction box in operative relation with and extending in the direction of the closed draw run of said web between said wedge-shaped spaces, and

wherein transverse seals project from said closed wall proximate to said wedge-shaped spaces in operative relation with and extending transverse to the direction of the closed draw run of said web between said wedge-shaped spaces,

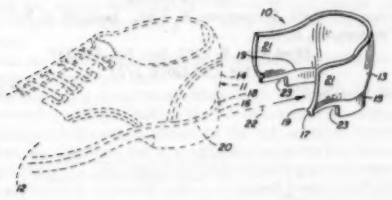
said transverse seals acting to inhibit the production of a subatmospheric pressure in a central region of the closed draw run, and said seals guiding said drying fabric at a distance from said substantially planar wall.

4,441,264

DRIVER'S HEEL GUARD

Diane Hantz-Guibas, and John C. Guibas, both of 164-08 85th Ave., Jamaica, N.Y. 11432

Filed Mar. 22, 1982, Ser. No. 360,344
Int. Cl.³ A43B *13/22, 13/26*
U.S. Cl. 36—72 B **3 Claims**



1. A driver's heel guard comprising, in combination a generally U-shaped body portion for clipping around a rear end of a shoe, a depending U-shaped skirt portion for shielding the shoe heel, the guard having an open bottom, an inwardly directed bead formed on the inner surface intermediate between said body portion and said skirt portion, a shoulder formed under said bead for locking onto a peripheral top surface of the heel of the shoe with the bead fitting into a recess of the shoe between the rear end of the shoe and the shoe heel, the distal ends of said skirt portion being notched so as to terminate in spaced relation prior to the distal ends of said body portion and said bead and shoulder, the distal ends of said body portion being outwardly flared, said body portion, skirt portion, bead and shoulder being molded of a semi-rigid plastic material and a spring steel clip being embedded inside the body portion above said head.

4,441,265

ATHLETIC SHOE WITH ANKLE SUPPORT STRAP

Christopher D. Burns, 415 Chapel St., Ottawa, Ontario, Canada K1N 7Z7; Guntis Obrascovs, 2 Sweetland Ave. Apt. 3, and Andrew L. Pipe, 3-47 First Ave., both of Ottawa, Ontario, Canada

Filed Apr. 5, 1982, Ser. No. 365,514
Claims priority, application Canada, Apr. 14, 1981, 375455
Int. Cl.³ A43B *5/04*
U.S. Cl. 36—117 **7 Claims**

1. An athletic shoe of the ankle boot type having a substantially unstretchable band of flexible material secured to the boot to extend along the outside of the upper adjacent the sole from a position rearwardly of the calcaneo fibular ligament of a wearer to a position adjacent the transverse tarsal joint, said band being configured to extend in use from the outside of the upper over the dorsal surface of the boot to the inside of the

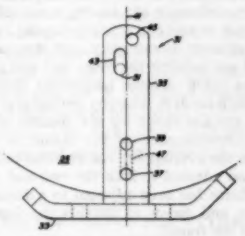
ankle adjacent the distal tibia of a wearer, and fastener means for securing the band to the ankle of the boot.

4,441,266

SKID SHOE MOUNTING ARRANGEMENT FOR SNOW BLOWER

David A. Westimayer, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Nov. 29, 1982, Ser. No. 444,947
Int. Cl.³ E01H *5/09*
U.S. Cl. 37—244 **2 Claims**



1. An improved skid shoe and mounting assembly for mounting said skid shoe to a respective sidewall of a snowblower auger housing said skid shoe having a base section extending generally horizontally and a strut section extending generally vertically from and fixably mounted to said base section, wherein the improvement comprises:

said strut section having sequentially aligned along the general vertical center line of said strut, a first hole, a second hole, a vertical slot and a third hole;

said slot being horizontally off-centered from said vertical center line in one direction and said third hole being horizontally offset from said vertical center line in another direction;

said sidewall having a generally vertical extending slot followed by a hole vertically spaced apart from said slot in said sidewall and horizontally displaced to one side from the vertical center line of said slot;

said strut being attachable to said sidewall in a plurality of vertical positions such that in a first of said vertical positions said first hole in said strut is aligned with said lower portion of said slot in said sidewall and said hole in said sidewall is aligned with said lower portion of said slot in said strut, in a second of said vertical positions said second hole in said strut is aligned with said upper portion of said slot in said sidewall and said hole in said wall is aligned with said upper portion of said slot in said strut, in a third of said vertical positions said second hole in said strut is aligned with said lower portion of said slot in said sidewall and said third hole in said strut is aligned with said hole in said sidewall, and

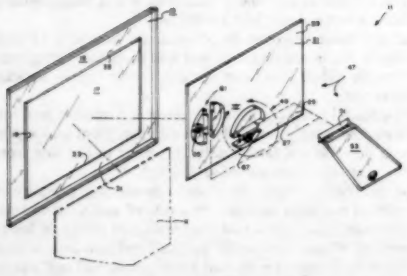
means for fixably and detachably mounting said skid shoe to

said sidewall such that said base of said skid shoe is below said sidewall in all of said plurality of vertical positions.

4,441,267
PELT STRETCHER
Albert S. Doss, Rte. 2, Box 532, Farmville, Va. 23901
Filed Aug. 18, 1981, Ser. No. 293,917
Int. Cl.³ D06C *3/08*; C14B *1/26*
U.S. Cl. 38—102.8 **3 Claims**

1. A pelt stretching device which comprises a frame in the form of an elongated resilient element extending in a circle of variable circumference and having a pair of overlapping end portions, each of said end portions having an element integral therewith adjacent its extremity, said integral element extending around and holding the other said end portions, but each end portion being slidable lengthwise through the integral element which holds it, whereby the integral elements hold the frame in a circular shape but are slidable along the frame to vary the circumference of the frame, a releasable clamp mounted on the overlapping end portions between the integral elements and adapted to lock the two end portions together when the frame has been adjusted to a desired stretching circumference, and means to connect the frame to a pelt surrounded by the frame.

4,441,268
PICTURE FRAMING DEVICE
Doug Scott, 7081 Great Oaks Rd., Germantown, Tenn. 38138
Filed Jul. 19, 1982, Ser. No. 399,315
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—152.1 **21 Claims**



16. A picture framing device for displaying an enclosure, which device comprises:

(a) a clear plastic frame means for establishing a marginal border surrounding the enclosure to be displayed;

(b) a clear plastic lens-like means integrally formed and joined to the frame means to provide an obverse, protective, transparent cover for the enclosure to be displayed;

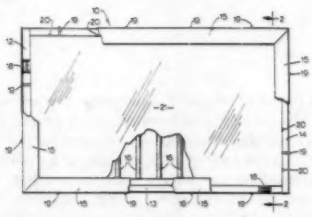
(c) confinement means comprising the frame means and lens-like means which together define a depression containing four marginal edges thereabout into which depression the enclosure is inserted for display through the lens-like means;

(d) a plastic rigid backplate means for nestled reception of the backplate means within the depression to retain the enclosure in the depression;

(e) interlocking means to retain the backplate means in a frictional, nestled relationship within the depression and into a close retaining contact with the back of the enclosure to be displayed, which interlocking means comprises an undercut marginal edge and a right angle wall portion extending therefrom and an opposite remotely-spaced straight edge in the confinement means and a chamfered marginal edge and a right angle wall portion extending therefrom and an opposite remotely-spaced straight edge in the backplate means, the undercut edge and the chamfered edge and the respective opposite edges in a close, cooperative, frictional engagement within the depression so as to retain the backplate means in a close, nestled, and frictional relationship within the depression; and

(f) support means to place the device in a displayable position.

4,441,269
SIGN FRAME
Byron M. Dahl, Watertown, S. Dak., assignor to Esco, Inc., Watertown, S. Dak.
Filed Mar. 9, 1982, Ser. No. 356,331
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—156 **12 Claims**



1. A sign structure comprising:

a plurality of elongated sign frame elements each joined at its ends to an adjacent sign frame element to define a sign frame having a closed center portion;

a facing material having an edge corresponding to each edge of said sign frame and having a shape and size sufficient to cover one face of said sign frame;

a facing material gripping means associated with each edge of said facing material for gripping said facing material;

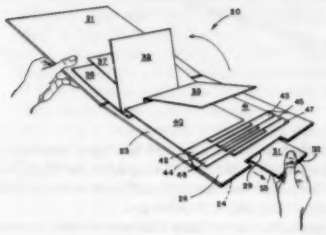
connection means for connecting each of said facing material gripping means to a corresponding sign frame element; and

wherein each of said sign frame elements includes an elongated, generally flat base having a pair of generally parallel longitudinal edges and being disposed at right angles with respect to said facing material, a first flange portion integrally formed with one of the longitudinal edges of said base and extending inwardly toward said center portion of said sign structure at right angles to and inwardly of the innermost portion of said base and a second flange portion integrally formed with the other of the longitudinal edges of said base and extending outwardly from said center portion of said sign structure in a direction opposite said first flange portion and at right angles to and outwardly of the outermost portion of said base.

4,441,270
STAGGERED FLIP-PAGE DISPLAY FOLDER

Christopher S. Crowell, Lyme, and Warren Dennison, East Lyme, both of Conn., assignors to Structural Graphics, Inc., Essex, Conn.

Filed Aug. 11, 1982, Ser. No. 407,103
Int. Cl.³ G09F 19/00
U.S. Cl. 40—534 6 Claims



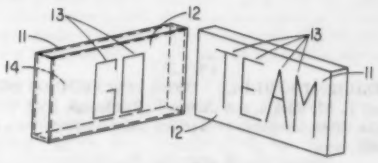
1. A multi-page folder comprising:
a back cover panel bounded by a right fold line,
a contiguous base panel joined to the back cover panel at the right fold line,
central slot means formed in at least one of said panels near the right fold line joining the back panel and the base panel,
a distal segmented tab extending from the base panel away from the right fold line,
means forming a plurality of substantially parallel fold lines traversing and subdividing the tab into plural segments,
an elongated drawstrip joined to the tab segment remote from the right fold line extending between the back cover panel and the base panel through the central slot means, longitudinally movable from a retracted position substantially flattening the segmented tab to an extended position protruding through the central slot means beyond the right fold line and curling the segmented tab under the base panel toward the slot means,
and a plurality of individual separate pages respectively secured to individual segments of the segmetned tab successively oppositely offset laterally in a direction substantially parallel to said parallel fold lines and thus being interleaved in staggered array,
whereby progressive movement of the drawstrip from its retracted position towards its extended position causes progressive curling movement of the segmented tab, successively flipping over the individual staggered interleaved pages, while at all times displaying to view at least one full page and a substantial area of an underlying staggered page, thereby changing only part of the indicia displayed during each successive stage of the page-flipping operation.

4,441,271
COMBINATION PORTABLE SEAT CUSHION AND PENNANT

Earl Hutchinson, 110 Dellwood Ave., Lockport, Ill. 60441

Filed Jul. 19, 1982, Ser. No. 399,598
Int. Cl.³ G09F 21/02
U.S. Cl. 40—584 8 Claims

1. A portable seat cushion and pennant, comprising cushion means to provide a cushioned seat, said cushion means including multiple message completion and display means to display parts of a message in the form of different completed messages when so arranged, said cushion means including a first cushion and a second cushion, said first and second cushions being operatively connected for movement between a first position and a second position, said first position being substantially side-by-side relationship of said first and second cushions, said second position being one of said first and second cushions above the other to provide a double cushion seat, including operative connection means to receive said first and second cushions for movement between said first and second positions, said cushions being removable from said operative connection means for separated and associated use for at least one other purpose than as a cushion, said operative connection means including a carrying case, said carrying case including a first pocket and a second pocket, said first and second pockets each including an open end to receive respective ones of said first and second cushions in said pockets, said pockets being joined in side-by-side relationship along a common border, said pockets being foldable on said common border for operative move-

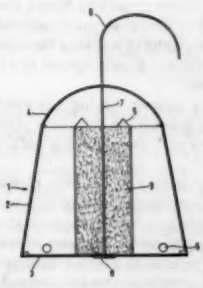


ment of said pockets between a first position of substantially side-by-side relationship and a second position in which one of said pockets is above the other, wherein said first pocket includes a pair of hand grasp apertures formed in the side wall thereof near said open end, oppositely disposed and each aperture of said pair in substantial registration with each other, said second pocket includes a pair of hand grasp apertures formed in the side wall thereof near said open end, oppositely disposed and each aperture of said pair in substantial registration with each other, both of said pairs of hand grasp apertures being in substantial registration with each other when said first and second pockets are in said position one above the other.

4,441,272
METHOD AND APPARATUS FOR ATTRACTING USEFUL INSECTS

Gisela Bartz, Winnekendonker Str. 43, 4179 Kevelaer 2, Fed. Rep. of Germany

Continuation of Ser. No. 142,683, Apr. 22, 1980, abandoned.
This application Dec. 10, 1981, Ser. No. 329,613
Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918852
Int. Cl.³ A01M 1/00
U.S. Cl. 43—1 9 Claims



9. A method for controlling harmful insect pests populating a vegetated area by attracting beneficial insects, comprising the steps of:
(a) providing in said vegetated area a container having a plurality of openings therein for permitting free entry and exit of said beneficial insects;
(b) providing in said container an environment preferred by

said beneficial insects by partially filling said container with a non-poisonous natural beneficial insect attracting substance;

(c) attracting said beneficial insects to said container;

(d) permitting said beneficial insects to freely enter said container for seeking shelter therein; and

(e) permitting said beneficial insects to freely exit said container for consuming said harmful insect pests for thereby controlling said harmful insect pests.

4,441,273

RESILIENT FERRULE COVER FOR FISHING RODS

Robert L. McMickle, and James T. Rumbaugh, both of Spirit Lake, Iowa, assignors to Berkley and Company, Inc., Spirit Lake, Iowa

Filed Mar. 1, 1982, Ser. No. 353,513
Int. Cl.³ A01K *87/00*
U.S. Cl. 43—18.1 **2 Claims**

1. A ferrule for connecting two tapered sections of fishing rod comprising:

a male ferrule portion projecting from a chamfered distal tip portion of a first tubular segment, said male ferrule having a diameter substantially less than the diameter of said first tubular segment and gently tapered to a reduced diameter at its distal end;

a second tubular segment having a tapered inner core constructed and arranged to receive a portion of said male ferrule therein with the remaining portion being exposed; and

a ferrule cover having an outside diameter substantially equal to the outside diameter of said second tubular segment and having an inside diameter at one end substantially equal to the inside diameter of said second tubular segment and tapered to a larger diameter at the other end thereof, said ferrule cover constructed from a resilient flexible material to permit the larger diameter portion of said ferrule cover to slide over the exposed portion of said male ferrule portion and abut the chamfered end of the first tubular segment and to slide up the chamfered end of the first tubular segment and over the distal end of said first tubular segment as increased wear between said ferrule and said core reduces the length of the exposed male ferrule portion.

4,441,274

FISHING LURE HOLDER

John J. Masur, 4460 Bedford Ave., Omaha, Nebr. 68111

Filed Jul. 29, 1982, Ser. No. 403,033
Int. Cl.³ A01K *97/06*
U.S. Cl. 43—25.2 **5 Claims**

1. In combination with a fishing rod having a handle, a rod portion having a plurality of spaced line guides, a reel, a fishing line extending from said reel through said guides, and a fishing lure on the end of said line, comprising,

a closeable container comprising first and second container portions which are spaced apart when the container is in its open position and which are positioned adjacent each other when the container is in its closed position,

each of said container portions having an outer peripheral rim portion and an inner peripheral rim portion which define a storage compartment therebetween,

the inner peripheral rim portions of said container portions being spaced apart to permit the positioning of said rod portion therebetween,

at least one of said outer peripheral rim portions having a slit formed therein to permit the fishing line to be extended thereby so that the fishing lure may be stored within one of said storage compartments,

and means for maintaining said container in its closed position around said rod portion with said fishing lure within said one storage compartment,

each of said inner peripheral rim portions defining a V-shape to permit one of said line guides to be received thereby to prevent the rotation of said container with respect to said rod portion when said container is positioned on said rod portion in its closed position.

4,441,275

SWIMMING SPOON LURE

Edmund E. Leszkiewicz, 420 W. Camp McDonald Rd., Prospect Heights, Ill. 60070

Continuation of Ser. No. 947,341, Oct. 2, 1978, abandoned. This application Jun. 30, 1980, Ser. No. 164,032
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.06 **3 Claims**

1. A fish lure capable of emulating a random swimming motion comprising

an elongate lure body having a forward end and a trailing end and opposed side edges, and having a substantially overall side to side arcuate configuration and including a convex bottom surface and a concave top surface,

each of said opposed side edges includes a recess disposed adjacent to said forward end of said lure, and a rise portion positioned rearward of said recess portion, the corresponding recess and rise portions of each of said side edges being asymmetrical along a horizontal axis measured from one side edge to the opposed side edge thereof,

said lure body provided with a plurality of apertures disposed through said lure body in a plurality of rows spaced apart along the length thereof,

each of said apertures being provided with a flared scoop disposed along a portion of the circumferential periphery of said corresponding aperture and extending outwardly from said convex bottom surface,

each of said flared scoops facing in the general direction of said forward end of said lure body and being positioned askew with respect to the adjacent flared scoops of the immediately adjacent rows such that none of the flared scoops in the immediately adjacent rows are in parallel alignment one with respect to the other, and said fish lure being completed by tie means at said forward end thereof to permit attachment to a fish line, and a hook assembly secured to said trailing end thereof, said trailing end further being provided with a flange positioned at approximately a ninety degree angle relative to said lure body and transverse to the path of water as it travels through said apertures and directed thereagainst by said flared scoops associated with each of the apertures,

whereby when said fish lure is in use, said flared scoops associated with each of said apertures will function to have the tendency to direct said fish lure body in different random directions, while said arcuate configuration of said lure body will cause said fish lure to travel in an up and down and side to side pathway such that said fish lure body will have the overall appearances emulating a random swimming motion thereby to function as a source of attraction to fish.

4,441,276

WINDOW REGULATING DEVICE FOR A WINDOW GLASS OF A VEHICLE DOOR OR THE LIKE

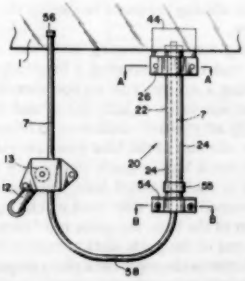
Takayo Chikaraishi, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 16, 1981, Ser. No. 283,804

Claims priority, application Japan, Jul. 26, 1980, 55-102663; Aug. 1, 1980, 55-106164

Int. Cl.³ E05F *11/48*

U.S. Cl. 49—352 **7 Claims**



1. In a vehicle door having a window glass, a window regulator mechanism for raising and lowering said window glass along a path from a predetermined position within said door comprising:

an elongate tube located on the outboard side of said path;

an elongate cable slidingly disposed within said tube;

a manually operated mechanism, operatively connected to said cable for moving said cable axially within said tube, including a handle having a shaft arranged to extend across the path of said window to limit the movement of the window away from said predetermined position, said shaft extending from the inboard side of said door toward the outboard side thereof;

a stationary guide rail disposed adjacent said tube on the outboard side of said path, said guide rail having a pair of acutely bent sides which extend on either side of said tube so as to partly enclose same; and

a slide member slidably received on said guide rail, said slide member having a pair of arms which embrace the sides of said guide rail, said slide member being attached to said window glass and to said cable for movement therewith.

4,441,277

INVERTIBLE PREFABRICATED DOOR

Donald B. Naylor, deceased, 1400 Pidco Dr., Plymouth, Ind. 46563 (Marshall County Bank & Trust, executor)

Continuation of Ser. No. 107,036, Dec. 26, 1979, Pat. No. 4,305,229, which is a continuation-in-part of Ser. No. 27,875, Apr. 6, 1979, abandoned, which is a continuation of Ser. No. 607,028, Aug. 22, 1975, Pat. No. 4,161,845. This application Aug. 10, 1981, Ser. No. 291,295

The portion of the term of this patent subsequent to Jul. 24, 1996, has been disclaimed.

Int. Cl.³ E06B *3/32*

U.S. Cl. 49—380 **1 Claim**

1. An invertible prefabricated door assembly for mounting within a wall opening defined by a foundation and overhead support, said door assembly comprising a panel, first and second jambs, a first combined header and threshold means, a second combined header and threshold means, said jambs and both combined header and threshold means forming a four-sided enclosed frame, said panel fitting within said frame and having opposite vertical side edges, and hinge means pivotally connecting said panelat one side edge to said first jamb, each of said first and second combined header and threshold means being mountable either to the foundation or the overhead support of said wall opening depending upon the desired location of said hinge means, and including a first part which said panel overlaps when closed and a second part extending substantially forwardly from said first part and defining a threshold when located adjacent said foundation and a header when located adjacent said overhead support, said first part being offset from said second part and separated therefrom by a

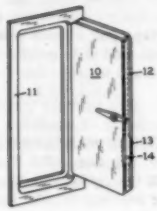
shoulder constituting a portion of each combined header and threshold means, and said shoulder being overlapped by said panel when the panel is closed.

4,441,278

MOUNTING FOR ENDLESS SEALING STRIPS

George H. Covey, III, Pawling, N.Y., assignor to The Presray Corporation, Pawling, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,427
Int. Cl.³ E06B 7/16
U.S. Cl. 49—477 **8 Claims**



1. A sealable closure, comprising
(a) a closure member having a substantially flat surface,
(b) an endless, continuous, elongated flexible sealing strip having a uniform, generally I-shaped cross section, with broad base and top portions interconnected by a neck having a narrow width, relative to said base and top portions,
(c) a continuous groove in said flat surface of the same length as the strip,
(d) two continuous fins, running on either side of and overhanging the bottom of said groove,
(e) said fins dividing said groove into a continuous inner channel and a continuous outer channel, separated by a throat, having a narrow width relative to the width of each of said inner and outer channels,
(f) the base portion and the neck of said strip being proportioned to fit closely but slidingly within said inner channel and said throat, respectively, of said groove,
(g) said continuous fins being arranged and configured to form an entrance slot-forming notch of limited length where said throat is wider than the base portion of said sealing strip,
(h) the base portion of said strip being formed to include a finite section of reduced width relative to the remaining sections of the base portion where the base portion is narrower than said throat,
(i) the notch being adapted to receive the base portion of said continuous strip, whereby the sealing strip may be inserted into the groove by initially placing the finite section of the base portion into the entrance slot-forming notch, sliding the base portion under the fins and into the inner channel, and sliding the sealing strip along the groove.

4,441,279

PORTABLE SHARPENER

Nelson Storm, Rossville, and Gregory A. Storm, Hoopeston, both of Ill., assignors to E-Z Products, Inc., Rossville, Ill., by said Nelson Storm

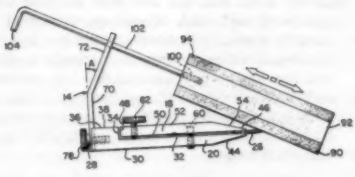
Filed Sep. 4, 1981, Ser. No. 299,569
Int. Cl.³ B24B 3/54
U.S. Cl. 51—69 **5 Claims**

1. A portable hand held blade sharpening device comprising a vise having an upper and a lower jaw adapted to grip the blade to be sharpened therebetween, the lower jaw including a forward end and a rearward end, a bottom extending from end to end, a flat upper surface extending rearwardly from the front end and terminating in a vertical upstanding shoulder surface, a flat surface extending from the rear end forwardly to intersect the vertical shoulder above the flat upper surface thereby forming a positioning body portion bounded by the flat surface extending from the rear end, the bottom, the rearward end and the vertical upstanding shoulder, generally parallel sides connecting the bottom with the flat surface and the flat upper surface to form a generally rectangular vise lower jaw,

an upper jaw adjustably mounted on the lower jaw, said upper jaw comprising a forward end and a rearward end, a top extending from end to end, a flat bottom surface extending from end to end to form a bottom jaw surface generally coextensive with the flat upper surface of the lower jaw, generally parallel sides connecting the top and flat bottom surface to form a generally rectangular vise upper jaw,

screw means adjacent the forward ends of the upper and lower vise jaws to control and vary the space between the confronting jaw surfaces, screw means carried by one of the jaws adjacent the rearward end thereof to engage the confronting jaw surface of the other jaw to cause pivoting of one jaw with respect to the other about the screw means adjacent the forward ends of the jaws,

the rearward end of the lower jaw being provided with a central recess bounded by vertical shoulders extending throughout the height thereof, a guide bracket affixed to the rearward end of the lower jaw in said recess, said guide bracket comprising a rectangular guide arm sized to



fit into the central recess in the rearward end of the lower jaw, said arm having a bottom and a top, a guide plate extending from the top of the guide arm, said guide plate being inclined toward the forward end of the lower jaw, said inclination commencing when the guide plate attaches to the guide arm, the guide plate being provided with two parallel guide slots extending transversely of the guide plate and parallel to the end of the lower jaw, screw means for affixing the guide bracket to the rear end of the lower jaw,

a sharpening tool cooperating with the vise and guide bracket, said tool comprising a longitudinally extending base having a square cross section thereby forming four equi-sized side faces, at least one of said faces being provided with an abrasive stone sized to be coextensive with said face, one end of the base being provided with a centrally threaded hole, a guide rod having a threaded end mounted in said threaded hole whereby every abrasive stone mounted on the side faces will be equi-distant from the center of the base, the guide rod fitting in and passing through one of the guide slots to control the angle of the abrasive stone with respect to a plane projected outwardly from between the confronting surfaces of the upper and lower jaws, whereby when a blade is held between the upper and lower jaws the blade will be positioned in the aforesaid plane so that the angle of sharpening will be determined by the transverse guide slot in which the guide rod is positioned.

4,441,280
DEVICE FOR CENTERLESS GRINDING OF ROTATION-SYMMETRICAL SURFACES ON WORK PIECES

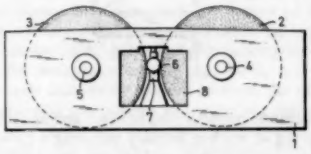
Walter Wetzels, Aachen, Fed. Rep. of Germany; Kurt Crott, Eupen, Belgium, and Erich Voell, Roetgen, Fed. Rep. of Germany, assignors to Schumag GmbH, Aachen, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,760

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1979, 2949538

Int. Cl.³ B24B *41/00*

U.S. Cl. 51—103 R **13 Claims**



1. Device for centerless grinding of rotation-symmetrical surfaces on workpieces at a grinding station, comprising drive means for turning a workpiece about the axes of symmetry thereof during grinding, a support bar for supporting the workpiece during turning, a rotatable disc being perpendicular to and disposed on each side of the workpiece generating vibrations of operating frequencies at the grinding station during grinding, at least one of said discs being a grinding wheel operating under grinding pressure, mechanical bearing supports and feed means for said discs forming an oscillating system with said discs generating resonance frequencies, and rigid connecting means for forming a direct rigid linkage of forces between said bearing supports and for increasing the resonance frequencies of said oscillating system to the range of approximately 1000 Hz, said range being beyond said operating frequencies, said rigid connecting means being in the form of two side plates, said bearing supports being held in said side plates and said discs being disposed between said side plates.

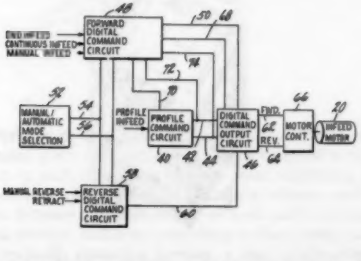
4,441,281
PULSE CANCELLATION CIRCUITRY

Ronald J. Gordiski, Ansonia, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Mar. 29, 1982, Ser. No. 362,597

Int. Cl.³ B24B *51/00*

U.S. Cl. 51—165.87 **20 Claims**



1. A roll grinding machine having a system for controlling the infeed positioning of a grinding wheel relative to the roll, said system comprising:

means for defining a grinding profile along the length of the roll;

means, responsive to the defining of a grinding profile for selectively producing first and second trains of pulses; the first train of pulses defining an inward motion of the grinding wheel relative to the roll and the second train of pulses defining an outward motion of the grinding wheel relative to the roll;

means for generating a pulse signal defining an additional inward motion of said grinding wheel relative to said roll; and

means for selectively processing the pulse signal defining the additional inward motion of said grinding wheel so as to either add a pulse to the first train of pulses or cancel a pulse occurring in the second train of pulses.

4,441,282
SUSPENDED CEILING

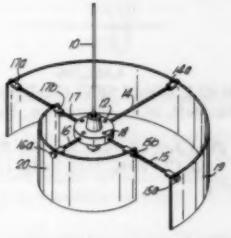
Jacques G. L. Thual, Paris, France, assignor to Hunter Douglas International N.V. Rooi Catootje, Curacao, Netherlands

Filed Apr. 21, 1982, Ser. No. 370,207

Claims priority, application United Kingdom, Apr. 24, 1981, 8112724

Int. Cl.³ E04F *19/00*

U.S. Cl. 52—39 **12 Claims**



1. A suspended ceiling comprising a carrying structure, a plurality of suspension units depending from said carrying structure, a plurality of slat assemblies each comprising a number of slats arranged to form a decorative pattern, each said slat assembly being mounted on one suspension unit, so as to be capable of at least limited rotation between a number of preselected different positions, and means to restrain the slat assemblies in each such position, whereby each slat assembly may have its orientation relative to its neighbouring slat assemblies varied, thereby varying the overall ceiling pattern.

4,441,283
STEEPLE

Heinz G. Schuette, Brevard, N.C., assignor to Horst Witt, Berkley, Mich.

Filed Jun. 23, 1982, Ser. No. 391,125

Int. Cl.³ E04B *7/00, 5/52*

U.S. Cl. 52—57 **19 Claims**

1. A steeple comprising:

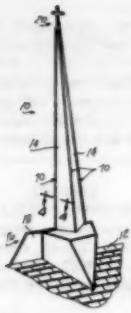
a plurality of inclined leg members, the lower ends of which are laterally spaced apart a greater distance than the corresponding upper ends, each of the leg members having a channel-shaped cross-sectional configuration opening outward from the steeple;

a plurality of vertically spaced means for connecting the leg members into a rigid frame with the leg members disposed at the corners thereof, each connecting means including a plurality of cross members, each extending between and joined to opposed ones of the leg members;

a plurality of planar outer panel members, each having a configuration complimentary to the configuration of the frame between adjacent corner leg members;

molding means for bending the side edges of the outer panel members around the outer ends of the leg members and into secure engagement with the inner surfaces of the leg members;

means for mounting the lower ends of the leg members to the roof of a building; and



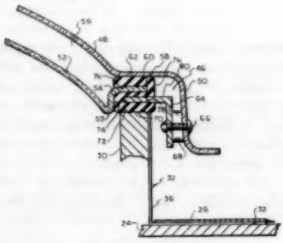
an indicia bearing member receivable within and secured to the upper ends of the leg members.

4,441,284

DOUBLE DOME SKYLIGHT ASSEMBLY

Stephen K. Bechtold, 28 Soundview Ave., East Northport, N.Y. 11731

Filed Jun. 10, 1982, Ser. No. 387,214
Int. Cl.[2] E04B 7/18; E04D 13/03
U.S. Cl. 52—72 **8 Claims**



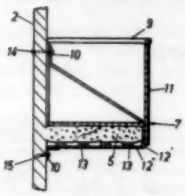
1. A skylight assembly adapted to be mounted to cover an opening in a roof structure comprising; a linear adapted to be mounted adjacent the edge of the opening in the roof structure around the periphery to surround the opening and to form a wall extending upward from the roof structure, an outer dome and an inner dome spaced from one another and with the outer dome overlying the inner dome, both of said domes engaging sealing means positioned on the liner wall, a supporting frame coupled to said dome and sealing means arrangement and the frame and arrangement being hinged to said liner to permit shifting thereof with respect to the liner between a closed position overlying the opening in the roof structure and an open position permitting access to the opening from the exterior of the roof structure, the domes being spaced from one another essentially a uniform distance over substantially their entire adjacent surfaces overlying the opening in the roof structure, the sealing means being a gasket positioned around the upper end peripheral surface of the wall of the liner, the inner side of the gasket having a slot therein adapted to receive and seal the peripheral edge of the inner dome, the outer side of the gasket having a slot therein to sealingly engage the frame attached to the outer dome, and a portion of the outer dome inwardly spaced from its outer peripheral edge resting on the upper surface of the gasket.

4,441,285

PREFABRICATED BALCONY UNIT

Bengt E. Fridolfsson, Onsala, Sweden, assignor to Foga System Bygg AB, Sweden

Filed Jul. 22, 1981, Ser. No. 286,045
Claims priority, application Sweden, Aug. 1, 1980, 8005506
Int. Cl.[3] E04G 13/06; E04F 19/00
U.S. Cl. 52—73 **3 Claims**



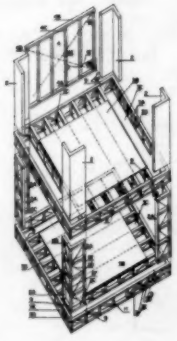
1. In combination prefabricated balcony unit and a building structure having an existing balcony including a cantilevered reinforced concrete slab base, said balcony unit comprising: a box shaped platform structure being open toward said building structure and sized for and enclosing said slab and having sufficient strength to support normal loads intended to be carried by said slab and also the weight of said slab, attaching means for affixing said platform structure to said building structure, safety rails arranged around the periphery of said platform structure, and attaching means for securing said safety rails to at least one of said structures.

4,441,286

PREFABRICATED CUBE CONSTRUCTION SYSTEM FOR HOUSING AND CIVIC DEVELOPMENT

Joseph Skvaril, 4807 - 143rd St., Edmonton, Alberta, Canada T6H 4C9

Continuation-in-part of Ser. No. 66,544, Aug. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 816,526, Jul. 18, 1977, abandoned. This application Dec. 15, 1981, Ser. No. 331,007
Claims priority, application Canada, Oct. 11, 1977, 1018719
Int. Cl.[3] E04H 1/00
U.S. Cl. 52—79.1 **18 Claims**



1. A plurality of statically complete and independent cube skeleton structural unit components for detachable arrangement and securement together with adjacent surfaces being in interfacial flush relationship, each of said components comprising in combination a pair of similar square horizontal ceiling/-floor components each including a perimetrical frame and load bearing means for maintaining the components in spaced and parallel relationship with one another, said load bearing means

consisting solely of four L-shaped cross sectioned corner bearing wall components each of which directly abuts and is secured at each end thereof to a corresponding corner of the associated frame of said horizontal components at the upper and lower edges of the bearing wall components, vertically extending means for operatively and detachably connecting said ceiling/floor components and said bearing wall components together, each of said bearing wall components including a pair of vertically situated flanges at right angles to one another for reducing the span of the roof component frame members, the thickness of the perimetrical frame and the thickness of the flanges of the L-shaped bearing wall components being similar to produce a flush fitting smooth inner and outer surface therebetween so that the vertical center line of the portions of the perimetrical frame overlying the flanges and the vertical center line of each of the flanges of the L-shaped bearing wall components are in corresponding vertically alignment thus developing the said statically complete and independent cube skeleton structural unit, fill-in, non-bearing wall components detachably secured between the outer edges of said horizontal components and extending therebetween, the thickness of said non-bearing wall components being substantially equal to the thickness of the vertically situated flanges of said bearing wall components and at least one lateral edge of the non-bearing wall components being secured to a corresponding lateral edge of said vertically situated flange so that the non-bearing wall components form a flush continuation of said vertically situated flanges of said bearing wall components.

4,441,287

FRAMED BUILDING CONSTRUCTION

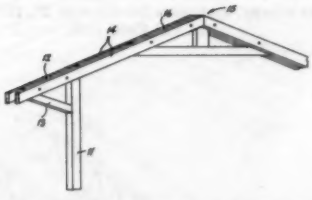
William Muir, Nedlands, Australia, assignor to Engineered Roof Trusses Pty. Ltd., Welshpool, Australia

Filed Jul. 22, 1981, Ser. No. 286,044

Claims priority, application Australia, Jul. 24, 1980, PE4675; Nov. 11, 1980, PE6349; Sep. 2, 1981, PE7999

Int. Cl.³ E04B 7/02; E04C 3/36

U.S. Cl. 52—93 **16 Claims**



1. Building construction comprising a plurality of pairs of upstanding posts, each pair of posts being mounted in opposed relation to each other, said pairs of posts supporting a roof structure comprising sets of parallel beams, wherein each beam extends between a respective pair of posts and is mounted to one side thereof, each post comprising a subassembly comprising a vertically extending member, a transversely extending strut directly fixed to the upper end of said vertically extending member and supported by a brace extending diagonally between said strut and an intermediate point of said vertically extending member and directly affixed to said strut and said vertically extending member to form a triangular reinforced area, said strut being located in parallel relationship to the respective beam and being fixed thereto.

4,441,288

BREAK-AWAY SECTIONALIZED DRIVEN ROD

Gilbert J. Feldman, and Richard A. Feldman, both of Tucson, Ariz., assignors to Allied Surveyor Supplies Mfg. Company, Tucson, Ariz.

Filed Oct. 26, 1981, Ser. No. 315,254

Int. Cl.³ E01F 9/02

U.S. Cl. 52—103 **8 Claims**

1. A break-away rod survey monument adapted to be driven into the ground including in combination:

first and second elongated cylindrical rod sections, with at least the upper end of said first rod section and at least the lower end of said second rod section having a cylindrical hole extending to a predetermined depth therein along the axis thereof;

a hollow cylindrical spring roll pin having a longitudinal slot therein and having an unstressed diameter which is slightly greater than the internal diameter of the cylindrical holes in said first and second rod sections for tightly but detachably connecting the upper end of said first rod section with the lower end of said second rod section in end-to-end relationship with said spring roll pin inserted into the holes in said rod sections, said spring roll pin pulling out of at least one of said rod sections in response to relative lateral displacement forces or axial pulling forces applied to said rod sections; and

said first rod section having means for retaining it in the ground and being terminated by a penetrating point at the lower end thereof.

4,441,289

EARTHQUAKE-RESISTANT REINFORCEMENT STRUCTURE FOR AN EXISTING BUILDING WITH COMPRESSION BRACES OR TENSION BRACES

Yamaguchi Ikuo; Higashibata Yasuo, and Fujimura Masaru, all of Tokyo, Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

Filed May 7, 1980, Ser. No. 147,365

Int. Cl.³ E04H 9/02

U.S. Cl. 52—167 **4 Claims**

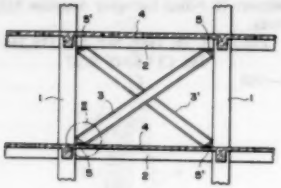
3. An earthquake-resistant reinforcement structure for a building comprising:

(a) compression braces;

(b) connectors of right triangle shape connected to each end of the compression braces; and

(c) tap bolts having a cutting lip at the end thereof for screwing through the two perpendicular sides of the right triangle shaped connectors into pillars and beams of the build-

ing to connect the compression braces diagonally relative to a pillar-beam frame element of the building whereby a



precompression stress is applied on the compression braces.

4,441,290

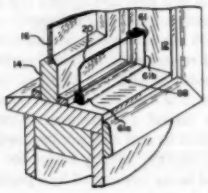
GLAZING FASTENER FOR MOUNTING EITHER RIGID OR FLEXIBLE STORM WINDOWS

Irwin R. Abell, Portland, Oreg., assignor to Hartwig-Hartoglass, Inc., Woodstock, Ill.

Division of Ser. No. 14,149, Feb. 22, 1979, Pat. No. 4,320,609. This application Jan. 8, 1982, Ser. No. 338,441

Int. Cl.³ A47H *13/00*

U.S. Cl. 52—202 **10 Claims**



1. Combination glazing and window sash apparatus, for securing a glazing sheet in a window opening, said apparatus comprising:

a channel strip including a first lengthwise-extending channel having two generally parallel, inwardly opposed side walls and a channel bottom wall connecting said side walls, one of said side walls including at least two spaced-apart lengthwise-extending channel ribs;

and a second lengthwise-extending channel adjacent to one of the side walls of said first channel, said second channel being narrower at a first depth than its width at a second depth;

assembly means for joining two of said channel strips together, said assembly means including a member adapted for lengthwise insertion into said second channel; and

a glazing strip for securing an edge of said glazing sheet to said channel strip, said glazing strip means having an insert flange adapted for insertion into said first channel; said insert flange having opposite sides and at least two flange ribs extending lengthwise therealong and positioned for engaging said channel ribs; and external flange means extending laterally from an outer portion of said insert flange for engaging said glazing sheet.

4,441,291

PANEL, IN PARTICULAR FOR SELF-SUPPORTING ROOF STRUCTURES AND SELF-SUPPORTING ROOF STRUCTURES ASSEMBLED OF SUCH PANELS

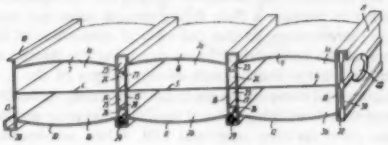
Henryk Sokoler, Roskilde, Denmark, and Poul H. Evers, Pura Tessin, Switzerland, assignors to Everlite A/A, Skaevinge, Denmark

Filed Sep. 9, 1981, Ser. No. 300,510

Claims priority, application Denmark, Jul. 20, 1981, 3236/81

Int. Cl.³ E04C *1/00*

U.S. Cl. 52—309.1 **12 Claims**



1. A panel for self-supporting roof structures of the type comprising elongated extruded profile elements of plastics material, each said element having at least two side-by-side longitudinal main ducts with external and internal convex outer surfaces and separated by a longitudinal extending secondary duct;

the outer sides of the profile elements having coupling members for securing one profile element side by side to adjacent similar profile elements so as to form a continuous surface requiring only support along two opposite ends;

an intermediate wall in each main duct dividing it into two subducts, said intermediary wall being situated approximately halfway between said external and internal convex outer surfaces; and

each secondary duct being divided into at least two subducts by at least one partition wall which lies in general alignment with said intermediary walls in the adjacent main ducts.

4,441,292

FLOOR

Axel B. R. Ericsson, Holmsund, Sweden, assignor to Profoment Utvecklings AB, Sweden

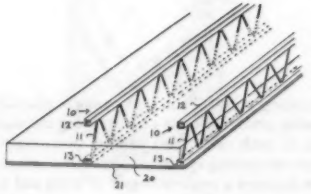
PCT No. PCT/SE80/00053, 371 Date Oct. 21, 1980, 102(e) Date Oct. 21, 1980, PCT Pub. No. WO80/01817, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 27, 1980, Ser. No. 198,004

Claims priority, application Sweden, Feb. 27, 1979, 7901731

Int. Cl.³ E04C *1/00*

U.S. Cl. 52—309.7 **10 Claims**



1. Floor component comprising joists and slabs arranged between the joists, each of the joists includes a web arranged between two flanges for supporting a load perpendicular to the flanges, the web having a lattice structure, the slabs being the sole interconnection between the joists, said slabs being self-supporting and consisting of a cast, light cellular foamed plastic material, a top surface of the slabs being lower than a top surface of the joists and extending through the lattice.

4,441,293

CONSTRUCTION PANELS

George McQueen, Paisley, Scotland, and Victor E. Barrable, Gerrards Cross, England, assignors to Cape Boards & Panels Limited, Middlesex, England

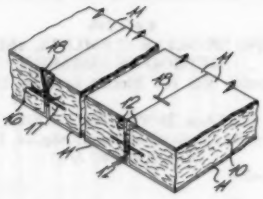
PCT No. PCT/GB81/00162, 371 Date Apr. 12, 1982, 102(e) Date Apr. 12, 1982, PCT Pub. No. WO82/00679, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 21, 1981, Ser. No. 371,304

Claims priority, application United Kingdom, Aug. 13, 1980, 8026445

Int. Cl.³ E04B *5/00*

U.S. Cl. 52—377 3 Claims



2. A floor comprising a plurality of construction panels assembled in edgewise abutting relationship, said panels each comprising a non-combustible fire-resistant board faced with metal on at least one of its major faces, edge grooves in each panel, splines inserted in the edge grooves of adjacent abutting panels, and staples driven into said adjacent abutting panels with their limbs deflected by contact with the splines.

4,441,294

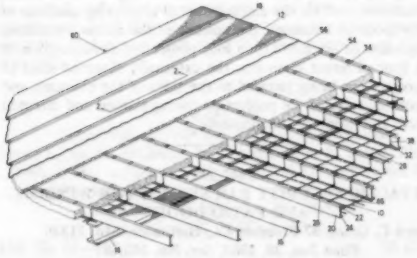
SUPPORT FOR ROOF INSULATION IN METAL BUILDINGS AND METHOD FOR INSULATING THE ROOF OF SUCH BUILDINGS

Robert E. Riley, 5110 Hammersley Rd., Madison, Wis. 53711

Filed Jun. 7, 1982, Ser. No. 385,510

Int. Cl.³ E04B *2/28*

U.S. Cl. 52—404 8 Claims



1. A support grid (10) in a roof insulation in a metal building having a roof (12) with rigid roofing material (18) fastened on top of spaced, substantially identical purlins (16), each purlin (16) having a substantially vertical web (20), an upper flange (22) extending laterally therefrom, and a lower flange (24) extending laterally therefrom and toward an adjacent purling (16), comprising:

(a) a plurality of cross members (26) adapted to extend transversely between adjacent spaced purlins (16), each cross member (26) having a bar (28) extending for substantially the distance between adjacent purlins (16), a first end (30) adapted to rest on the lower flange (24) of a first purlin (16), and a second end (32) adapted to be hooked, prior to the application of the rigid roofing material (18), over the upper flange (22) of the adjacent purlin (16) toward which the lower flange (24) of the first purlin (16) extends, the second end (32) of the cross member (26) including a hook (38) having a suspension portion (40) that extends upwardly from the bar (28) for a distance selected to be at least as great as the depth of insulation material (34) to be supported and a holding portion (42) extending from the end of the suspension portion (40) remote from the bar (28) substantially parallel to the bar (28) for a selected distance away from the first end (30) of the cross member (26), the holding portion (42) of the hook (38) adapted to rest on top of the upper flange (22) of said adjacent purlin (16) in supporting relation; and

(b) a selected number of support members (46) extending longitudinally at angles to the cross members (26) and rigidly engaged therewith, whereby the support grid (10) may be dropped easily into place on the purlins (16) as a pre-assembled unit from above prior to application of the rigid roofing material (18) the rigid engagement of the support members (46) to the cross members (26) causing the support grid (10) to be fixed in position without the need for fastening to the purlin so as to receive and support insulation material (34) within the space between the supporting purlins (16) in selected proximity to the rigid roofing material (18), support grid allowing insulation to fill the space entirely from the vertical web of one purlin to the vertical web of the adjacent purlin.

4,441,295

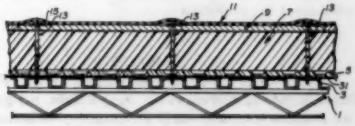
GRID SYSTEM ADHERING TECHNIQUE AND METHOD OF PRACTICING SAME

Thomas L. Kelly, 31 Sands St., Waterbury, Conn. 06723

Filed Apr. 30, 1981, Ser. No. 259,200

Int. Cl.³ E04B *5/00*

U.S. Cl. 52—408 17 Claims

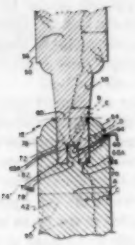


1. A roofing installation comprising a deck, a flexible membrane forming an upper roof surface and a plurality of substrates underlying the flexible membrane including the deck and blocks of insulation supported by the deck with each of the insulation blocks fixed relative to the deck in abutting relation to adjacent blocks of insulation, the substrate which is in direct underlying relation to the flexible membrane having a plurality of discrete abutting members, and adhesive means between the flexible membrane and said directly underlying substrate for securing the same, the adhesive means being applied in a predetermined pattern wherein the adhesive means covers and adheres preselected confronting areas of the flexible membrane and said directly underlying substrate in sealed engagement to provide adhesively sealed areas of high integrity between the flexible membrane and said directly underlying substrate, the adhesively sealed areas being in overlying, lapping relation to abutting perimeters of the substrate directly underlying the flexible membrane, the pattern of the adhesive means additionally providing selected adhesive-free zones between the flexible membrane and said directly underlying substrate completely free of the adhesive means.

4,441,296
FIRE RESISTANT WOOD DOOR STRUCTURE

James F. Grabendike, and Donald E. Grabendike, both of Wichita, Kans., assignors to Sun-Dor-Co., Wichita, Kans.

Filed Dec. 14, 1981, Ser. No. 330,039
Int. Cl.³ E06B 3/72
U.S. Cl. 52—456 4 Claims

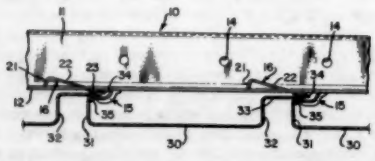


1. A fire resistant door structure constructed of a wood material adapted to pass testing laboratories' fires resistant specification, comprising:
(a) a door assembly including a support frame assembly having a panel assembly connected thereto:
(b) said panel assembly including a plurality of panel members, each of said panel members secured at outer peripheral edges of an adjacent portion of said support frame assembly by a double connector assembly.
(c) said double connector assembly including a male connector assembly mounted within a female connector assembly;
(d) said male connector assembly includes a pair of projecting connector leg members;
(e) said female connector assembly includes a connector cavity to receive said connector leg members therein and a connector projection integral with said support frame assembly extended between said connector leg members; and
(f) an outer end of said connector projection not extended beyond an adjacent edge of said support frame assembly;
whereby a fire test applied to one side of said door structure may burn through one of said connector leg members but said panel members are held in place by the other one of said connector leg members.

4,441,297
PANELLING AND CARRIERS THEREFOR

Willem Rijnders, Alblasserdam, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 267,527, May 27, 1981. This application Apr. 9, 1982, Ser. No. 367,106
Claims priority, application United Kingdom, Jun. 17, 1980, 8019715
Int. Cl.³ E04B 5/52
U.S. Cl. 52—478 14 Claims

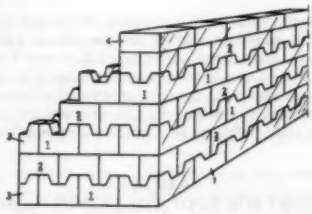


1. A carrier adapted to support adjacent panels of thin material in overlapping position where each of said panels has a main panel portion with an inturned side portion on each of two opposite sides; one side portion having a rim at its free edge turned towards the other side portion, and the other side portion having an arm at its free edge turned away from the one side portion, characterized in that said carrier comprises an elongate body adapted to be secured to a support structure and adapted to support said panels in their overlapping position, a plurality of lugs on said body, the lugs being arranged in pairs, with the pairs of lugs being spaced from one another along the length of said carrier and with the lugs of a pair being spaced from one another along the width of said carrier, the first lug of each pair being substantially rigid and including a tongue adapted to support the rim of one panel and the arm of an adjacent panel, the second lug of a pair being adapted to hold the arm and rim of said adjacent panels in position at the tongue of the first lug.

4,441,298
NESTING MODULAR ELEMENTS, AND THEIR METHOD OF ASSEMBLY

Louis Limousin, 3bis rue Nicolas Leblanc, 18000 Bourges, France

Filed Aug. 25, 1980, Ser. No. 180,831
Claims priority, application France, Aug. 24, 1979, 79 21718
Int. Cl.³ E04C 1/10
U.S. Cl. 52—594 5 Claims



1. Nesting modular elements for use whole or divided into fractions thereof wherein the whole element comprises a solid central core; an upper face having at each corner of the face a symmetrical projecting frustopyramidal projection, the projections forming a cross-shaped recess in the central portion and upper plane of the core; a lower face having a closed recess internally thereof for the engagement of projecting portions of similar modular elements, the volume of the recess permitting engagement of not more than four projecting portions formed upon four different elements, the externally directed sides of the projections being parallel to the sides of the elements and the internal sides of the projections being slanted and directed towards the inside of the elements.

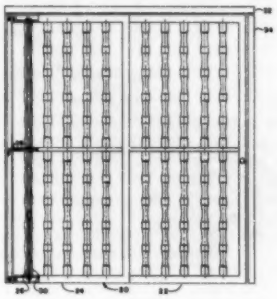
4,441,299
METALLIC SECURITY BAR SYSTEM FOR WINDOW AND PATIO DOORS

Richard C. Gries, 37 Freedom Ct., Baltimore, Md. 21220

Filed Jan. 28, 1982, Ser. No. 343,487
Int. Cl.³ E04H 3/08; E04C 3/30
U.S. Cl. 52—656 1 Claim

1. In a metal security bar system of the type used as patio door, window and the like, with top (36) and bottom (38) horizontal frame members and first and second vertical side frame members (40, 42), a plurality of laterally-spaced vertical rods (26) held thereby, a plurality of tubular wooden covers (78, 80) over each said vertical rods (26); and a perforate horizontal bar (28) holding a middle portion of said plurality of laterally-spaced vertical rods (26), the improvement comprising: means for improving the appearance and feel of said metal security bar system and retarding condensation thereon including: a substantially complete wood cover over said security bar system, said wood cover including: a first channel section cover (70,72) over each of said vertical side frame members (40, 42), a second channel-section cover (66, 68) over each of

said top and bottom horizontal frame members (36, 38) first and second cover plates (96) respectively on said first (70,72) and second (66,68) channel-section covers, each said second channel-section cover (66,68) having in section a first leg and a second leg, the structure of each second leg defining a plurality of slots (94) in said second leg for receiving said plurality of laterally-spaced vertical rods (26) respectively in said slots (94) in the second leg, a third channel-section cover (76) over said perforate horizontal bar (28), the third channel-section cover (76) having a plurality of aligned slots (82) therethrough for respectively receiving said plurality of laterally-spaced vertical rods (26), a third cover plate (104), said third cover plate (104) on said third channel-section cover (76), each said tubular wooden cover (78, 80) having respective square-section ends



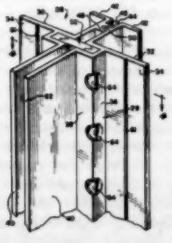
thereof abutting a second channel-section cover (66,68) at a said slot (94) in the second channel-section cover and abutting the third channel-section cover (76) at a said aligned slot (82) in the third channel-section cover (76), means providing for said respective ends of said tubular wooden covers to cover said slots (94) in said second channel-section covers (66,68) and said aligned slots 82 in said third channel-section cover, comprising said first and second (96) and third (104) cover plates being on respective outside parts of said first (70,72), second (66,68) and third (76) channel-section covers, and each of said plurality of slots (94) and plurality of aligned slots (82) having a rounded-end offset co-acting with said first (70,72), second (66,68) and third (76) channel section covers and completely covering said plurality of slots (94) and plurality of aligned slots (82).

4,441,300

BRACKET SUPPORT FOR WALL STUDS

David S. Varon, Highland Park, and Burton L. Siegal, Skokie, both of Ill., assignors to Crown Metal Manufacturing Company, Chicago, Ill.

Filed Aug. 14, 1978, Ser. No. 933,496
Int. Cl.³ A47G 29/02; A47F 5/08
U.S. Cl. 52—732 **10 Claims**



1. A bracket retaining and support structure for use with wall studs and adapted for having a plurality of hook-ended brackets mounted thereto and comprising:

A. a pair of elongate extruded metal members secured together, each member having central wall structure defining a rectangular groove forming approximately half of a bar-receiving slot therein and the grooves being aligned, opening to one another and spaced apart to provide an intervening space therebetween,

B. cooperative friction interlocking means effective when engaged to secure the members together along the lengths thereof at the rear of said structure, the interlocking means being spaced from said bar-receiving slot,

C. a lateral wing formed integral with said respective member, outwardly extending therefrom and adapted to receive wallboard thereon, said wings being located at the center of said structure and defining a plane generally parallel with the plane of said bar-receiving slot,

D. a forwardly extending flange on the front of each member, said flanges being spaced apart, opening to said intervening space and adapted to straddle brackets inserted therein, and

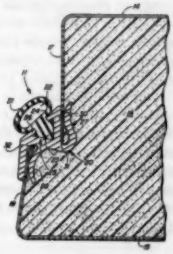
E. a flat bar engaged within said bar-receiving slot and bridging the intervening space and tightly secured in said rectangular grooves along opposite, vertical, elongate edges thereof to cooperate with said interlocking means to maintain the structure in assembly as a unit, said bar having vertically disposed central spaced passageways aligned with the space formed between the forwardly extending flanges so as to be able to receive the hook ends of brackets which are inserted through said last-mentioned space, and the bar is provided with knurling along at least one flat surface thereof.

4,441,301

GARAGE DOOR PANEL APPARATUS AND METHOD

Henry E. Benson, Orlando, Fla., assignor to Architectural Specialties Co., Inc., Orlando, Fla.

Filed Aug. 30, 1982, Ser. No. 413,149
Int. Cl.³ E04B 2/28
U.S. Cl. 52—804 **7 Claims**



1. A garage door panel comprising in combination:

a metal skin formed to a generally door panel shape and having elongated parallel edges along one edge side thereof;

an elongated, non-metallic barrier strip attached to each elongated parallel edge to hold said parallel edges together and to space said parallel edges from each other;

filler material filling said formed metal skin held together with said elongated barrier strip; and

an elongated weatherstrip attached to said barrier strip to form a weather seal between one garage door panel and an adjacent panel, said elongated non-metallic barrier strip being formed of a polymer material having a cross-section shaped to form a pair of gripping clips, each positioned to grip one metal edge for spacing the metal edges from each other, said barrier strip cross-section being shaped to form a hollow triangle having three walls, a slot through one

wall thereof having a slot therethrough and having a first clip portion extending generally parallel to a second triangular wall adjacent said second wall to form a clip therewith and a third said triangle wall having a flange and a second clip portion extending at an angle from said third wall barrier strip adjacent to form a second clip therewith.

4,441,302

CIGARETTE PACKAGING MACHINE CONTROL AND MONITORING SYSTEM

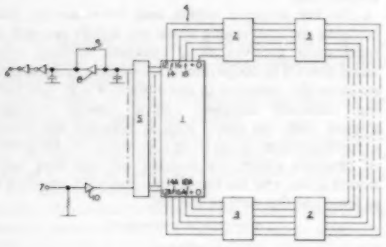
Denbigh M. Gabbitas, Orpington, and Peter J. Shawyer, London, both of England, assignors to Molins Limited, London, England

Filed Aug. 1, 1980, Ser. No. 174,505

Claims priority, application United Kingdom, Aug. 2, 1979, 7927003

Int. Cl.³ B65B *19/28*; H04Q *5/00*

U.S. Cl. 53—52 **31 Claims**



1. A packaging machine, for packaging cigarettes or other rod-like articles of the cigarette industry, comprising a plurality of machine parts for effecting respective operations associated with such packaging, a plurality of remote stations respectively connected to at least some of said parts, at least one of said remote stations comprising an input station arranged, when interrogated, only to receive signals from the respective part signifying the presence of a fault or other special condition, and at least another of said remote stations comprising an output station arranged, when interrogated, only to supply a machine control signal to the associated part, a control station connected with all of the remote stations in cascade and including means for interrogating the first remote station in the cascade, each station including means for relaying an interrogation signal to the next station so that the remote stations are sequentially interrogated in turn, and means including an information line connected to said remote stations and said control station for transferring fault and control signals between the remote stations and the control station.

4,441,303

CARTON-CLOSING MACHINE

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Feb. 3, 1982, Ser. No. 345,549

Int. Cl.³ B65B *7/24*

U.S. Cl. 53—374 **8 Claims**

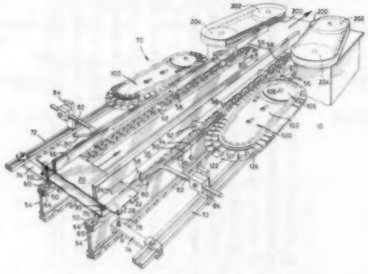
1. In a carton closing machine for closing a closure panel which is hingedly connected along a first hinge line to an open end of a carton, the closure panel having a closure tab hingedly connected thereto along a second hinge line, the closure tab being insertable within an opening in the open end of the carton to retain the closure panel in a closed position, said machine having a final closing station in first section of which the closure tabs are initially set by bending along the second hinge line and in a second section of which the tabs are tucked into the open end of the carton, said machine also having a primary conveyor for conveying cartons through the final closing station with the open ends of the cartons being continuously driven in a closure path in which the openings extend in a tucking plane, the improvement of;

(a) first plow means in said first section, said first plow means being arranged to fold the closure panel about said first hinge line to an intermediate position, folding edge means having a folding edge arranged to underlie said second hinge line when the closure panels are in the intermediate position,

(b) a dynamic setting and tucking mechanism for setting and tucking said tabs comprising;

(I) a plurality of setting members mounted for movement through the first section at a forward velocity substantially equal to that of the primary conveyor,

(II) a plurality of tucking members mounted for movement



through the second section at a forward velocity substantially equal to that of the primary conveyor,

(III) first activating means adapted to activate the setting members as they ae driven through said first section to cause the setting members to initially move laterally toward the closure plane to engage a carton tab and bend it over said folding edge along its second hinge line to its set position in which it is directed toward the open end of its associated carton,

(IV) second activating means adapted to activate the tucking members as they are driven through the said second section to cause the tucking members to move laterally toward the closure plane to engage the closure panel and move it toward the closure plane and thereby cause the tab to be driven into said openings to close the carton.

4,441,304

APPARATUS FOR OPENING OUT THE FILLING OPENINGS OF BAGS OF FOIL MATERIAL OR THE LIKE WHICH ARE CONNECTED TOGETHER IN THE MANNER OF A BAND

Rudolf Douwenga, Dalen, Netherlands, assignor to Lockwood International B.V., Nieuw-Amsterdam, Netherlands

Filed Feb. 27, 1981, Ser. No. 238,672

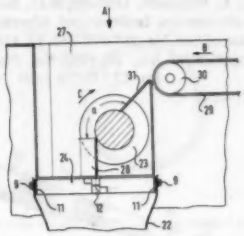
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1980, 3007588

Int. Cl.³ B65B *9/08*

U.S. Cl. 53—568 **6 Claims**

1. Apparatus for opening the filling openings of bags connected together in the manner of a band, consisting of two conveyor belts between which the opening edges of the bags are guided, and each of which is guided around at least one compensating roller displaceable in the direction of movement of the bags, a spreader arrangement which engages between the opening edges of the bags and comprises two flexible elements each fixedly mounted at one end and displaceable at the other end, and which together with the associated conveyor belts grip the opening edges of the respective bag and are displaceable in an outward direction by adjuster means for the purpose of forming a filling opening, a filler duct adjusted to the cross-section of the filling opening is arranged above the

latter providing a path for the filling material and is connected to a conveyor belt transverse to the direction of movement of the bags, a rotary symmetrical roller member mounted below said conveyor belt and under said filling material path so that the filling material is adapted to pass over said roller and arranged above at least one of the opening edges of the filling opening and rotatably mounted on a shaft extending substantially parallel to the direction of movement of the bag, said member being driven in opposition to the filling direction of the filling material, the surface contour of the roller being concave and adjusted to that of the filling opening and the filler duct connected thereto, and wherein a cover plate is arranged between the roller and said transverse conveyor belt and is fastened to said filler duct and partly covers the roller being adjusted to the contour of the latter.



4,441,305

MULTI-ROW CORN CUTTER FORAGE HARVESTER AND/OR CORN PICKER FORAGE HARVESTER

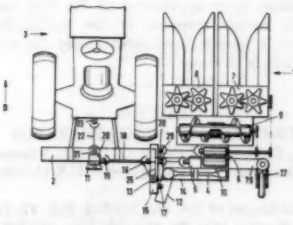
Wilhelm Lippl, Ichenhausen-Oxenbronn, Fed. Rep. of Germany, assignor to Karl Mengele & Söhne GmbH & Co., Günzburg, Fed. Rep. of Germany

Filed Sep. 2, 1982, Ser. No. 413,986

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137115

Int. Cl.³ A01D *73/00, 69/00*

U.S. Cl. 56—15.6 **3 Claims**



1. A multi-row corn cutter forage harvester and/or corn picker forage harvester, such as a disk wheel forage harvester, comprising a first crossbar arranged to be connected to the three-point towing bracket of a tractor, a side-mountable device comprising a frame, a harvester device mounted on said frame, said frame including a lockable swivel hinge for pivotally moving the frame and harvester device into a first operating position located along one side of the tractor and a second operating-transporting position located behind the tractor, and means for driving said harvester device in the first and second operating positions, wherein the improvement comprises an angular gear (20) located on said first crossbar (2) and arranged to be positioned opposite the power take-off shaft of the tractor, said driving means including a stationary gearing (15) mounted on said frame (14) adjacent said swivel hinge (13), said frame is pivotally displaceable by said swivel hinge through 180° between the first operating position and the second operating position, said driving means includes a first shaft connection (16) for said stationary gearing, a second shaft connection (28), and a third shaft connection (29) each of said first, second and third shaft connections extend parallel to said first crossbar in the first and second operating positions, said frame includes a second crossbar (26) disposed in parallel relation with said first crossbar in the first and second operating positions, said angular gear (20) including a drive shaft connection (19), a drive shaft (18) extending between said drive shaft connection and said first shaft connection, said second shaft connection located aligned with said first shaft connection and said third shaft connection spaced laterally from said second shaft connection, said harvester device including take-in elements (6) and a cutter wheel (4), means connecting said second shaft connection to said cutter wheel, means connecting said third shaft connection to said take-in elements, said stationary gearing including a fourth shaft connection (17), said first and fourth shaft connections spaced apart in the direction extending transversely of said first crossbar and disposed in parallel relation, said first shaft connection (16) and said second shaft connection (17) connected to said stationary gearing, and in said second operating position said fourth shaft connection (17) is connected to said drive shaft connection (19) via said drive shaft (18), wherein in the displacement of said frame and harvester device from the first operating position to the second operating position only said drive shaft (18) is changed from its connection to said first shaft connection (16) to said fourth shaft connection (17).

4,441,306

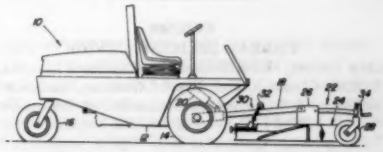
IMPLEMENT WORKING HEIGHT-ADJUSTMENT MECHANISM

John B. Kuhn, Mayville, Wis., assignor to Deere & Company, Moline, Ill.

Filed Sep. 1, 1982, Ser. No. 413,910

Int. Cl.³ A01D *35/26*

U.S. Cl. 56—15.9 **6 Claims**



1. In a mower blade housing and support therefor wherein the housing has one end supported by at least one vertically adjustable ground-engaging element and an opposite end suspendcd from at least one support member extending thereabove, an improved assembly for suspending said opposite end comprising: a lug fixed to one of said support member and said housing; a linear adjustment means fixed to another one of said support member and said housing; a first bracket connected to said linear adjustment means and the latter being selectively operable for moving the bracket relative to said lug; and link means connected between the lug and first bracket for causing said opposite end of the housing to be raised and lowered respectively in response to the linear adjustment means being operated for moving the first bracket away from and towards said lug.

4,441,307

HARVESTER HEADER WITH FLOATING CUTTER BAR

Michael H. Enzmann, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 30, 1983, Ser. No. 412,953

Int. Cl.³ A01D *67/00*

U.S. Cl. 56—208 **4 Claims**

1. In a crop harvester header having a transverse rear wall, a pair of upstanding end walls and a bottom structure extend-

ing between said end walls and to said rear wall, the combination comprising:

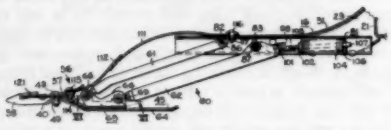
a flexible floating cutter bar extending transversely along the front of said bottom structure,

a plurality of link supported ground engaging skids secured in supporting relation to said cutter bar at transversely spaced intervals therealong,

at least one pair of fore and aft extending parallel links for each of said link supported skids,

means pivotally connecting rear parts of said links to said bottom structure for predetermined vertical swinging movement about longitudinally spaced transverse axes between raised and lowered positions of said cutter bar,

means pivotally connecting the front ends of each of said pair of links to the skid associated therewith,



a lever arm on the rear of one of said links of each pair,

a compression spring interposed between each of said lever arms and said header,

a first series of sheet springs having their rear ends secured to the top of said bottom structure and disposed generally horizontally along the front end of the header; and

a second series of generally horizontal sheet springs secured at their front ends to said cutter bar and extending rearwardly a substantial distance presenting rear ends in overlapping thrust transmitting engagement with the front ends of said first series of sheet springs, said sheet springs and compression springs complementally serving to at least partially support said cutter bar during the floating operation thereof permitted by said predetermined swinging movement of said links.

4,441,308

THREAD SPLICING DEVICE

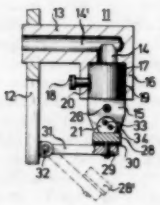
Joachim Rohner; Heinz Zumfeld, and Reinhard Mauries, all of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,881

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104367

Int. Cl.³ B65H *69/06*; D01H *15/00*; D02J *1/08*

U.S. Cl. 57—22 **10 Claims**



1. Thread splicing device, comprising a stationary base body having a compressed air conduction channel formed therein, a splicing head exchangeably connected to said base body and formed with an elongated splicing chamber wherein threads are insertable for joining, said elongated splicing chamber having a longitudinal axis, said splicing head having a compressed air conduction channel formed therein in communication with said compressed air conduction channel in said base body and terminating in said splicing chamber, and said splicing head having at least one air outlet slit formed therein at an inclination relative to the longitudinal axis of said splicing chamber and located at the terminus of said compressed air conduction channel in said splicing chamber, and a cover for temporarily covering said splicing chamber.

4,441,309

ZERO TORQUE HELICALLY WRAPPED CABLE

William C. L. Weinraub, Durham, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 284,499, Jul. 17, 1981, abandoned. This application Aug. 25, 1983, Ser. No. 526,386

Int. Cl.³ D07B *1/06*

U.S. Cl. 57—212 **9 Claims**

1. A cable comprising a substantially cylindrical core, the core having a torque response when a length of the core is stressed in axial tension, the cable further comprising a helical element surrounding the core substantially contactingly, with substantially constant lay angle, the lay angle being substantially equal to an angle θ

characterized in that

the angle θ is chosen in accordance with the formula

$$\theta = \tan^{-1}[N^{-\frac{1}{2}}],$$

where

$$N = \frac{-\Delta R_c/R_c}{\Delta L_c/L_c},$$

with R_c the radius of the core, L_c the length of a segment of the core, ΔL_c the change in the length of the segment upon application of a first axial stress to the core, and ΔR_c the change in the core radius upon application of the first axial stress, whereby the torque response of the helical-element-surrounded core is caused to be substantially the same as the torque response of the core.

4,441,310

FRICTION SPINNING APPARATUS

Alan Parker, Bolton, and Douglas O. Clough, Rossendale, both of England, assignors to Hollingsworth (U.K.) Limited, United Kingdom

Continuation-in-part of Ser. No. 349,541, Feb. 17, 1982. This application May 20, 1983, Ser. No. 496,745

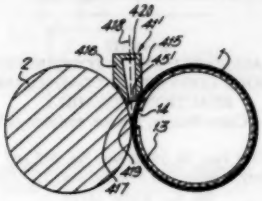
Claims priority, application United Kingdom, Feb. 21, 1981, 8105573

Int. Cl.³ D01H *7/892*, *1/135*

U.S. Cl. 57—401 **5 Claims**

1. In an apparatus for open-end spinning of yarn, of the type comprising two rotatable bodies each having a surface and arranged such that the surfaces define an elongate gap which narrows toward a line of closest approach of the surfaces, means for rotating one of the bodies in a direction so that the surface moves into the gap and means for moving the other body in a direction so that the surface moves out of the gap to twist fibres in the gap to form a yarn, means for withdrawing the yarn along the gap, and a fibre feed duct having an elongate mouth within the gap and defining a fibre feed passage having opposite side walls to feed fibres substantially directly into the gap such that some fibres can fall directly on to the yarn, the improvement wherein the fibre feed duct is formed of first and

second parts, said first part including a first planar portion defining a first planar jointing face between said first and second parts and also a first of said opposite side walls of said fibre feed passage, and said second part includes a second planar jointing face to contact sealingly said first planar jointing face



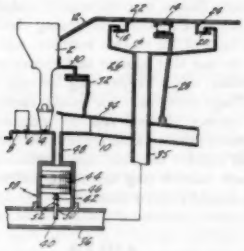
when the said first and second parts are assembled together to form said fibre feed duct, and said second part further defining a second of said opposite side walls and also end walls of said fibre feed passage which extend between said first and second opposite side walls.

4,441,311

MEANS FOR CONTROLLING THE AIR SCAVENGE PRESSURE IN THE BEARING COMPARTMENT OF A GAS TURBINE ENGINE

Claude P. Rotondo, Middletown, and John D. Robinson, Jr., Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 13, 1982, Ser. No. 377,758
Int. Cl.³ F02C 7/06
U.S. Cl. 60—39.08 **4 Claims**



1. In a gas turbine engine having a rotor and a compressor discharge passage:

a bearing for the rotor;

a compartment surrounding the bearing;

seals cooperating with the compartment to prevent leakage or oil from said compartment;

means for supplying compressor discharge air from said passage to said seals externally of the compartment;

a vent duct for the compartment;

a restrictive valve in said duct for controlling the air flow and;

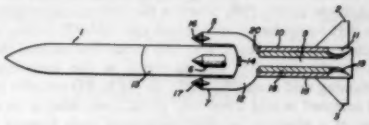
pressure actuated means responsive to compressor discharge pressure to actuate said valve.

4,441,312

COMBINED CYCLE RAMJET ENGINE

John R. Smith, Kettering, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 22, 1979, Ser. No. 51,315
Int. Cl.³ F02C 9/78
U.S. Cl. 60—245 **1 Claim**



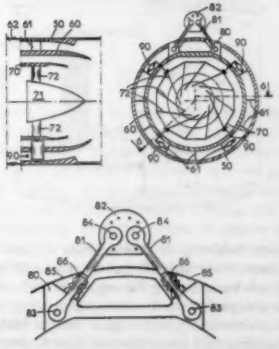
1. In a combined ducted rocket ramjet engine for a missile having a duct serving as a combustion chamber the wall of which is lined with solid rocket fuel for burning during the boost phase of missile flight and which terminates in a nozzle through which gaseous combustion products exit to produce thrust, having a fuel rich gas generator operative during the cruise phase of missile flight to discharge gaseous fuel into said combustion chamber, and having ram air inlets communicating with said combustion chamber which are closed during the boost phase and open during the cruise phase of missile flight, the improvement wherein the solid rocket fuel lining the combustion chamber is replaced by a two-layer lining in which the inner layer in immediate contact with the chamber wall is solid ramjet fuel containing no oxidizer and the outer layer is solid rocket fuel containing an oxidizer, the inner layer acting as an isulator during the boost phase, and as a fuel by its ablation during the cruise phase, after the outer layer of rocket fuel has been consumed during the boost phase, to augment the fuel supplied to the chamber by the gas generator and at the same time to protect the wall of the combustion chamber from the high combustion temperature during the cruise phase.

4,441,313

MOUNTING DEVICES FOR MULTIPLE FLOW TURBOJET ENGINES

Raymond J. M. Joubert, Savigny sur Orge, and Jean G. Bouiller, Brunoy, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

Filed Nov. 6, 1980, Ser. No. 204,582
Claims priority, application France, Nov. 12, 1979, 79 27771
Int. Cl.³ F02K 1/40, 3/02
U.S. Cl. 60—262 **3 Claims**



1. A device for mounting to a rigid support structure (80) of an aircraft having a turbine, said turbine having an axis, a

turbine exhaust casing (70) in a turbojet engine of the type having at least two flows, i.e. a central primary flow in the exhaust casing (70) and a secondary flow in a first shroud (60) surrounding the exhaust casing (70) and fastened to said support structure (80), said device comprising a plurality of connecting elements around the exhaust casing (70) and each comprising an arm (91) oriented in a plane transverse to the axis of the turbine, first means attaching each arm (91) to said first shroud (60) and second means attaching each arm (91) to the exhaust casing (70), wherein the first means attaching each arm (91) comprise an articulated joint (64-92) linking an intermediate portion of each arm (91) to the first shroud (60) while leaving the arm (91) free to rotate in the transverse plane containing said arms (91) and a tie (94 to 99) variable in length and oriented in said transverse plane, consisting of an arrangement of a plurality of parallelograms, each formed by four tierods (95) of the same length pivoted in pairs at their ends around four axles of articulation (66, 94, 96) common to all of the parallelograms and determining respectively four edges of dihedrons of a parallelepiped, one (66) of the axles being linked by means of an attach spacer (61) with the first shroud (60) of the secondary flow and with a second shroud (50) external to the first shroud (60) and fixed to the said support structure (80) and to a portion of the arm by means of first and second articulated joints free to rotate in said transverse plane and another axle (94) being linked with the arm (91) of the connecting elements (90) permitting the arm (91) to rotate relative to the exhaust casing (70) in said transverse plane and to have freedom of relative translation in said plane and further having a channel (73) fixed relative to the exhaust casing (70) thereby leaving the arm (91) free to translate relative to the exhaust casing (70) in a direction parallel to said axis, said tie (94 to 99), and further means to adjust a value of the dihedron angle of the arrangement, said means to adjust a value of the dihedron angle comprising at least one bolt (99) linking two consecutive tierods of at least one of the parallelograms and which consecutive tierods (95) are articulated on one of the axles (66, 94) connected with the attach spacer (61) and the arm (91).

4,441,314

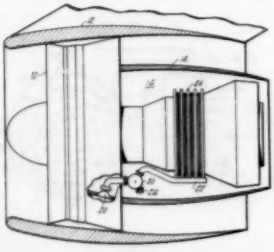
COMBINED TURBINE POWER PLANT BLADE TIP CLEARANCE AND NACELLE VENTILATION SYSTEM

David L. Fitton, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 191,185, Sep. 26, 1980, abandoned. This application Nov. 3, 1982, Ser. No. 439,019

Int. Cl.³ F02C *6/14*; F02K *3/06*

U.S. Cl. 60—266 **2 Claims**



1. A combined engine case cooling system and ventilation system adapted for aircraft having a nacelle housing the engine, a sheath surrounding the engine in said nacelle defining at least one compartment, a source of cooling air, at least one spray bar surrounding said engine case, a first conduit means interconnecting said spray bar and said source for conducting the cooling air from said source to impinge on the case of the engine through openings in said spray bar to cause it to shrink and second conduit means for conducting cooling air from said source to said compartment so as to ventilate said compartment, said combined engine case cooling system and ventilation system consisting of a single valve disposed in said first conduit means and said second conduit means and control means for controlling said single valve for rendering either said engine case cooling system or said ventilation system inoperative wihle the other is in the operating mode.

4,441,315

REACTION ASSEMBLY FOR A TORQUE CONVERTER AND A TORQUE CONVERTER COMPRISING SUCH A REACTION ASSEMBLY

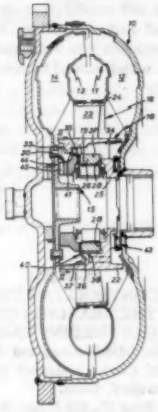
Jean C. Bochot, Claye-Soullly, France, assignor to Valeo, Paris, France

Filed Jan. 26, 1982, Ser. No. 343,107

Claims priority, application France, Jan. 27, 1981, 81 01452

Int. Cl.³ F16D *33/18*

U.S. Cl. 60—345 **11 Claims**



2. A reaction assembly for a torque converter, said reaction assembly comprising a reactor member having an axial bore and a transverse flange, an overrunning clutch having an outer race, said outer race of said overrunning clutch being engaged in said axial bore of the reactor member, said outer race bearing axially on one side against said transverse flange of said reactor member, and a keeper ring bearing against the other axial side of said outer race for axially maintaining the outer race with respect to said reactor member, the invention wherein bayonet mount means is provided between said keeper ring and said reactor member, and connecting means associated with said keeper ring for rotationally connecting said keeper ring to said reactor member.

4,441,316

WAVE ENERGY DEVICE

George W. Moody, Glasgow, Scotland, assignor to The Secretary of State for Energy in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland

Filed Nov. 20, 1981, Ser. No. 323,699

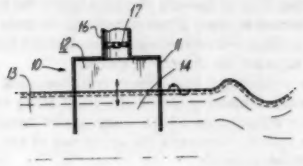
Claims priority, application United Kingdom, Dec. 1, 1980, 8038510

Int. Cl.³ F03B *13/12*

U.S. Cl. 60—398 **18 Claims**

1. A device for extracting energy from waves on a liquid, the device having a chamber with an opening for the flow of the liquid into and out of the chamber to provide a quantity of the liquid which is arranged to oscillate in the chamber from an oscillatory force produced by the effect of the waves, and

means for extacting energy from said oscillations, wherein the improvement comprises, means for determining the phase of said oscillatory force, means for determining the phase of the



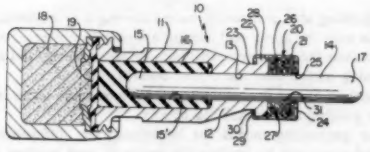
velocity of the oscillating liquid in the chamber, and means for shifting the phase of said velocity so that said velocity is substantially in phase with the phase of said oscillatory force.

4,441,317

PISTON AND CYLINDER TYPE THERMAL DEVICE PART THEREFOR AND METHODS OF MAKING THE SAME

Denis G. Wolfe, Chesterfield County, Va., and Naohisa Wada, Kawasaki, Japan, assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 16, 1981, Ser. No. 321,550
Int. Cl.³ F03G 7/06
U.S. Cl. 60—527 **10 Claims**



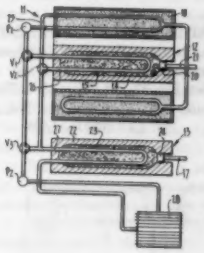
1. In a piston and cylinder type thermal device having a cylinder member carrying a piston stem that has an outer end that projects out of an opening of an end of said cylinder member to be extended and retracted relative thereto upon changes of sensed temperature of a charge of material disposed in said cylinder member that operatively acts on a resilient stem seat disposed in said cylinder member and having an opening in one end thereof that receives an inner end of said stem therein, said stem having a lubricant thereon to tend to prevent abrasion between said stem and said seat during said extended and retracted movement therebetween, lubricant storage means carried by said device and having therein porous means with said lubricant absorbed therein and being operatively associated with said stem for applying said lubricant to said stem external of said end of said cylinder member during said movement of said stem relative to said stem seat, the improvement wherein said lubricant storage means comprises a cup-shaped member having a closed end and an open end, said open end of said cup-shaped member being telescoped on said end of said cylinder member and having means securing said open end to said end of said cylinder member, said porous means being under axial compression between and against said end of said cylinder member and said closed end of said cup-shaped member.

4,441,318

METHOD AND APPARATUS FOR OBTAINING WORK FROM HEAT ENERGY

Alexander Theckston, 10 Emden Crescent, Mulgrave, 3170, Victoria, Australia

Continuation-in-part of Ser. No. 66,232, Aug. 13, 1979, abandoned. This application Jun. 16, 1982, Ser. No. 389,065
Claims priority, application Australia, Aug. 14, 1978, 5495
Int. Cl.³ F03G 7/06
U.S. Cl. 60—527 **16 Claims**



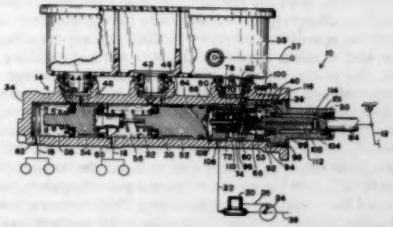
1. A method of obtaining mechanical work from heat energy comprising heating a body of liquid metal or liquid metal alloy confined within, but thermally insulated from, a pressure vessel having a coefficient of volume expansion less than said body of metal or metal alloy contained therein thereby to generate a volumetric expansion of said body whereby to cause an increase in pressure within the vessel and causing the increased pressure to move a load thereby to do work.

4,441,319

BRAKE BOOSTER

Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 1, 1982, Ser. No. 413,866
Int. Cl.³ B60T 13/12
U.S. Cl. 60—548 **10 Claims**



1. A brake booster having a housing with a bore therein, a piston movably disposed within the bore and cooperating therewith to partially define a pressure chamber communicating with a brake circuit and with a reservoir in a rest position, a valve assembly carried by the piston to move therewith within the bore, an end plug substantially closing one end of the bore and cooperating with the piston to define a work chamber therebetween, and an input member extending through the end plug to cooperate with the valve assembly, the input member being normally spaced from the valve assembly in the rest position and engageable therewith in an actuated position to open the valve assembly to communicate fluid pressure to the work chamber whereby the piston is moved to generate fluid pressure in the pressure chamber for communication with the brake circuit, characterized by said input member cooperating with said end plug to define an auxiliary cham-

ber, said input member including a first passage communicating the work chamber with the auxiliary chamber in the rest position, said end plug including a second passage communicating the auxiliary chamber with said housing bore, said housing including a third passage extending from said housing bore to said reservoir to communicate said work chamber with said reservoir in the rest position via said first, second and third passages, and said end plug including a first pair of sealing rings on opposite sides of said second passage cooperating with said housing bore whereby the communication from said work chamber to said reservoir is independent of said piston.

4,441,320

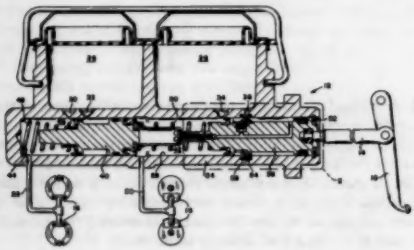
FAST-FILL MASTER CYLINDER

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 42,699, May 25, 1979, abandoned. This application May 11, 1981, Ser. No. 262,075

Int. Cl.³ B60T *11/08*

U.S. Cl. 60—578 **5 Claims**



1. In a fast-fill master cylinder having a housing defining a bore for receiving fluid from a reservoir, a primary piston movably disposed within the bore and a secondary piston movably disposed within the bore and cooperating, respectively, with the primary piston to substantially define a primary chamber and with the housing to substantially define a secondary chamber, the improvement wherein a resilient member is disposed within the bore, the bore forming a recess to fixedly dispose the resilient member therein, said resilient member cooperating with the primary piston to substantially define an auxiliary chamber, the housing bore having the same uniform diameter apart from the recess for said primary pressure chamber, said secondary pressure chamber and said auxiliary chamber, the primary piston substantially defining passage means communicating said auxiliary chamber with said primary pressure chamber, the primary piston being movable relative to said resilient member during a braking application to contract said chambers to communicate fluid pressure from said auxiliary chamber to the primary chamber, and the resilient member cooperates with the recess to define a pair of separate passages, one of the passages communicating fluid from the auxiliary chamber to the reservoir during the initial braking application and the other passage communicating fluid from the reservoir to the auxiliary chamber upon termination of the braking application.

4,441,321

COMPACT MIST FLOW POWER GENERATOR

Stuart L. Ridgway, Santa Monica, Calif., assignor to R & D Associates, Marina del Rey, Calif.

Filed Mar. 25, 1982, Ser. No. 361,863

Int. Cl.³ F03G *7/04*

U.S. Cl. 60—641.7 **19 Claims**

1. An apparatus for generating power from thermal differences in water supplies comprising:

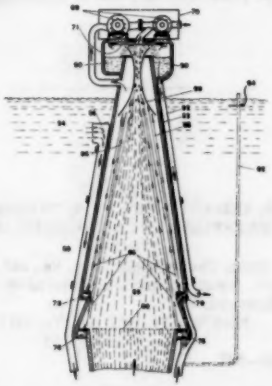
intake means for receiving water from a warm source of water;

dispersion means for producing a mist from said warm water in the form of warm water or brine droplets dispersed in water vapor formed by partial evaporation or boiling from the droplets, with vapor being the continuous phase;

guiding and containing means of substantial vertical extent for receiving the mist from the dispersing means and conducting it in an upward direction under the influence of a difference in vapor pressure between the main portion of said guiding and containing means and the lower end thereof adjacent the dispersion means;

means for condensing said water vapor coupled to said guiding and containing means at a point along its height following acceleration of the warm water droplets to a velocity sufficient to reach the upper end of the guiding and containing means;

collecting means for receiving the droplets of water at the higher elevation near the upper end of said guiding and containing means;



said guiding and containing means having a cross-sectional area near the upper end thereof approximately equal to or less than the cross-sectional area of said guiding and containing means near the center thereof;

evacuation means for removing noncondensable gases from the guiding and containing means;

power generating means for harnessing the difference of head produced by raising the water in said guiding and containing means; and

said apparatus including means for spraying water upward into said guiding and containing means at a significant angle inclined toward the axis thereof with said droplets initially having insufficient velocity along the axis of said guiding and containing means to reach the upper end thereof.

4,441,322

MULTI-STAGE, WET STEAM TURBINE

Emil W. Ritzi, Manhatten Beach, Calif., assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Continuation of Ser. No. 17,456, Mar. 5, 1979. This application Jan. 12, 1981, Ser. No. 224,180

The portion of the term of this patent subsequent to Mar. 31, 1998, has been disclaimed.

Int. Cl.³ F01D *1/18*; F01K *7/00*

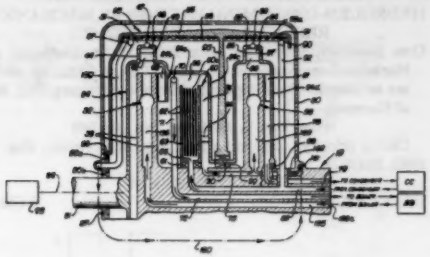
U.S. Cl. 60—649 **13 Claims**

10. In a turbine, the combination comprising

(a) first nozzle means to receive heated fluid for expansion therein to form a two-phase discharge of gas and liquid,

(b) a separator rotor having an axis, blades located to travel in the path of said discharge, and a rotating surface located radially outwardly of said blades for supporting a layer of separated liquid on said surface,

(c) the rotor having reaction nozzle means to communicate with said layer to receive liquid therefrom for discharge in



a direction or directions developing torque acting to rotate the rotor.

4,441,323

COMBUSTION EQUIPMENT FOR A GAS TURBINE ENGINE INCLUDING A FUEL BURNER CAPABLE OF ACCURATE POSITIONING AND INSTALLATION AS A UNIT IN A FLAME TUBE

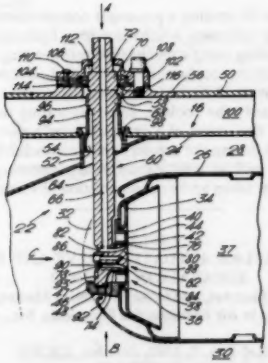
Rowan H. Colley, Sunnyhill, England, assignor to Rolls-Royce Limited, London, England

Filed Mar. 2, 1982, Ser. No. 354,047

Claims priority, application United Kingdom, Apr. 16, 1981, 8112098

Int. Cl.³ F02C 7/22

U.S. Cl. 60—737 **5 Claims**



1. Combustion equipment for a gas turbine engine having an engine casing with at least one hole therethrough, said combustion equipment being positioned within said engine casing and comprising:

at least one flame tube having a head at an upstream end thereof, said head having at least one aperture therein;

an annular swirler assembly positioned coaxially in said at least one aperture in the head of said flame tube;

a fuel burner capable of being installed as a unit through said at least one hole in said engine casing and accurately positioned in said swirler assembly, said fuel burner including a fuel feed arm and a fuel injector joined together as a unit, said fuel feed arm and said fuel injector each being cylindrical for a major portion of their length and having axes at an angle to each other, said fuel feed arm having at least one fuel passage and said fuel injector having an air duct therethrough coaxial with an axis of the fuel injector and having at least one fuel passage communicating with said fuel feed arm passage for injecting fuel into said air duct; and

locating means for accurately positioning said fuel injector in said swirler assembly when said fuel burner is installed as a unit through said at least one hole in said casing, said locating means including an upstream extending projection attached to said swirler assembly and having a recess and a face, said fuel injector having a tongue attached thereto and extending in a direction normal to the axis of the fuel injector, said tongue having a face thereon for abutting the face on said projection when said fuel injector is accurately positioned in said swirler assembly, said fuel injector having a partially spherical outer surface on a downstream end thereof which is positioned in said annular swirler assembly whereby when said fuel burner is inserted as a unit through said hole in said engine casing and the partially spherical outer surface of said fuel injector is inserted into the annular swirler assembly, the fuel burner can be rotated about an axis passing through a center of a sphere of which the partially spherical outer surface of the fuel injector forms a part to cause the tongue on the fuel injector to engage in said recess in the upstream extending projection so that the faces of said tongue and the upstream extending projection abut each other to accurately position the fuel injector coaxially in the annular swirler assembly.

4,441,324

THERMAL SHIELD STRUCTURE WITH CERAMIC WALL SURFACE EXPOSED TO HIGH TEMPERATURE

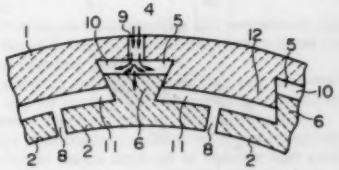
Toshio Abe, Komae; Hiroshi Ishikawa, Zama, and Shigeo Suhara, Hachioji, all of Japan, assignors to Kogyo Gijutsuin, Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,606

Claims priority, application Japan, Apr. 2, 1980, 55-42018

Int. Cl.³ F02G 1/00

U.S. Cl. 60—753 **3 Claims**



1. For use in a thermal shield structure having ceramic blocks for protecting a high-temperature exposed wall surface in which supporting members having a wedge-shaped groove and wedge-shaped members on said ceramic blocks to be supportedly received in said wedge-shaped groove, respectively provided on the wall surface wherein said supporting members and ceramic blocks, defining a plurality of pairs of wedge-groove couplings, are engaged with each other to cover the wall surface with said ceramic blocks, the improvement comprising: the wedge-shaped groove in each of said supporting members and each said wedge-shaped members to be supported thereby being dimensioned to define therebetween a gap in said wedge-shaped groove small enough to prevent mutual disengagement of each pair of the wedge-shaped couplings of the supporting members and the wedge-shaped supported members and sufficient to permit movement of the ceramic blocks relative to the wall surface, and for each wedge-shaped supported member a passage for a cooling air supply from behind and into each wedge-shaped groove of each supporting member provided so that each wedge-shaped supported member is urged by the pressure of supplied cooling air so as to be retained and positioned in the wedge-shaped groove of the corresponding support member, whereby the

corresponding ceramic blocks are moved to and held on the wall surface at a position defined by the individual wedge-shaped grooves on the supporting members and the corresponding wedge-shaped members to be supported in response to pressure from the cooling air introduced into each wedge-shaped groove of a supporting member.

4,441,325

REFRIGERATING OR HEAT PUMPING PROCESS AND APPARATUS

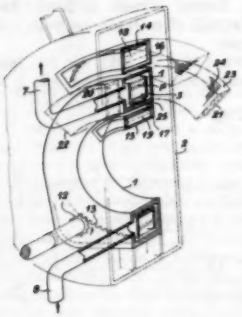
Gilbert Bon-Mardion, Eybens; Gerard Claudet, Grenoble, and Albert Lacaze, Meylan, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 24, 1982, Ser. No. 444,193

Claims priority, application France, Nov. 27, 1981, 81 22276

Int. Cl.³ F25B *21/02*

U.S. Cl. 62—3 **14 Claims**



1. A refrigerating or heat pumping process using a paramagnetic substance and a fluid in contact therewith, wherein it comprises performing:

a magnetization of the substance by a magnetic field, said magnetisation being performed thermally at a fluid temperature close to a first temperature T_1 of a heat source;

a cooling of the substance by heat exchange with the fluid between the first temperature T_1 and a second temperature of said fluid close to a second temperature T_2 of a cold source;

a demagnetization of the substance by a magnetic field, said demagnetization being performed isothermally, at a temperature close to the second temperature T_2;

a heating of the substance by heat exchange with the fluid between the second temperature T_2 and the first temperature T_1;

the isothermal magnetization of the substance being performed by removing the magnetization heat by means of the fluid, by relative displacements of the fluid and the substance, the fluid firstly displacing in the displacement direction of the substance and then in the direction opposite thereto, in such a way that the temperatures at the start and finish of magnetization are the same.

4,441,326

PROCESS FOR COOLING THE PASSENGER COMPARTMENTS OF VEHICLES WITH HYDROGEN-CONSUMING ENGINES BY MECHANICAL REFRIGERATING PROCEDURE

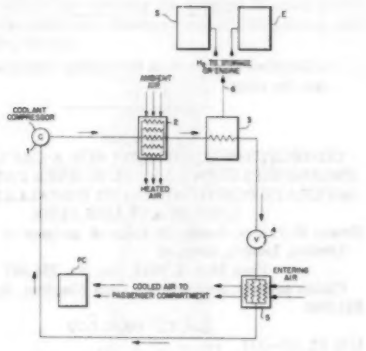
Otto Bernauer, Weinstadt; Hans-Peter Holzt, Esslingen, and Hermann Lenz, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,049

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047023

Int. Cl.³ F25B *19/00*

U.S. Cl. 62—7 **6 Claims**



1. A process for cooling a passenger compartment of a vehicle comprising equipping a vehicle with a hydrogen-consuming engine, cooling using a mechanical refrigerating procedure wherein a gaseous coolant is compressed, condensing the resulting compressed and heated gaseous coolant with heat removal to liquefy the coolant, and evaporating the liquefied coolant under the action of a pressure relief valve, using the cold generated during the pressure relief to cool the passenger compartment, and at least partially implementing the heat removal by heat taken up by decomposition of a metal hydride.

4,441,327

TEMPERATURE ACTUATED VALVE AND PHASE SEPARATION METHOD

David J. Klee, Emmaus, and Peter C. Nelson, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

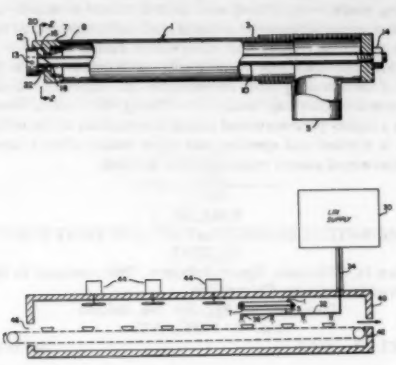
Filed Dec. 7, 1981, Ser. No. 328,052

Int. Cl.³ F17C *7/02*

U.S. Cl. 62—51 **6 Claims**

1. In a method of separating vaporized cryogen from its liquid phase in a liquid cryogen freezing system comprising a cryogen delivery system and a cryogen spray header system, which comprises the steps of allowing liquid cryogen to pass from a source of supply to a confined space comprising materials having different linear coefficients of expansion, releasing any vaporized cryogen through an opening in said confined space formed as a result of expansion of one of the materials of said space relative to the other, the improvement which comprises releasing the vapors from said confined space through an opening of a gradually increasing size in said confined space as said liquid cryogen vaporizes up to a temperature intermediate that of the liquid and room temperature, releasing the vapors through an opening of a constant size as said cryogen liquid continues to vaporize at temperatures above the intermediate temperature, wherein said intermediate temperature is selected to be that which produces a uniform flow rate of vaporized cryogen when the maximum liquid cryogen flow rate of the

cryogen delivery system is expanded to the maximum design pressure of the cryogenic freezing system, whereby a uniform



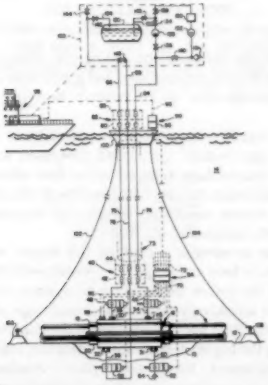
flow of liquid cryogen is passed through said spray header system.

4,441,328

METHOD AND APPARATUS FOR FORMING A TEMPORARY PLUG IN A SUBMARINE CONDUIT

Beryle D. Brister, Amarillo, Tex., assignor to Brister, Incorporated, Amarillo, Tex.

Filed Dec. 8, 1981, Ser. No. 328,028
Int. Cl.³ F25D *3/00*; D03D *49/00*
U.S. Cl. 62—53 **24 Claims**



1. A method for forming a temporary plug in a submarine fluid pipeline or the like comprising the steps of:

providing a quantity of freezable liquid at a predetermined location within said pipeline;

providing a generally cylindrical housing having an interior portion forming an annular chamber between the exterior surface of said pipeline and said housing when said housing is placed on said pipeline, said housing being longitudinally divided into at least two sections and having means thereon for conducting fluid to and from said chamber, said means including a plurality of conduits and respective remotely operable valves connected to respective ones of said conduits;

providing a pressure sensing element disposed on said housing for measuring the fluid pressure within said chamber;

installing said housing around the exterior of said pipeline at said predetermined location on said pipeline;

connecting at least one of said conduits to a source of low temperature fluid;

remotely controlling said valves to conduct low temperature fluid to said chamber to freeze said quantity of liquid to form said plug; and

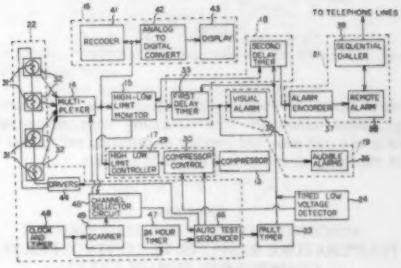
controlling the fluid pressure within said chamber in accordance with the pressure of the environment around the exterior of said housing.

4,441,329

TEMPERATURE CONTROL SYSTEM

Robert E. Dawley, 123 Bacon St., Natick, Mass. 01760

Filed Jul. 6, 1982, Ser. No. 395,862
Int. Cl.³ F25B *49/00*, *21/02*; G05D *23/30*
U.S. Cl. 62—126 **15 Claims**



1. A temperature control system comprising:

an enclosure defining a zone to be temperature controlled;

primary temperature conditioning means for changing the ambient temperature within said zone;

temperature sensing means for producing a temperature signal dependent on localized temperature within said zone;

controller means for controlling said temperature conditioning means in response to said temperature signal produced by said sensing means;

error detection means for monitoring said temperature signal, and for producing error signals in response to predetermined abnormal output conditions thereof;

auxiliary temperature conditioning means comprising thermoelectric means disposed in intimate heat exchanging contact with said sensing means and selectively energizable during a test period to substantially alter said localized temperature sensed by said sensing means without substantially changing said ambient temperature within said zone; and

fault means for producing fault signals in response to given defective output conditions of said temperature signal during said test periods.

4,441,330

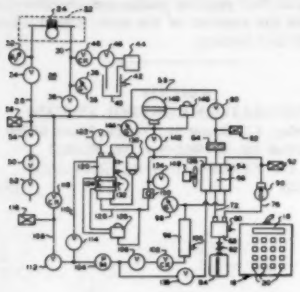
REFRIGERANT RECOVERY AND RECHARGING SYSTEM

Ralph C. Lower, Bryan, and Roger D. Shirley, West Unity, both of Ohio, assignors to Robinair Manufacturing Corporation, Montpelier, Ohio

Division of Ser. No. 211,571, Dec. 1, 1980, Pat. No. 4,364,236.
This application Jul. 29, 1982, Ser. No. 402,856
Int. Cl.³ F25B *45/00*
U.S. Cl. 62—149 **10 Claims**

1. A refrigeration circuit refrigerant processing system comprising, in combination, a manifold conduit adapted to be connected to the refrigeration circuit to be serviced, a pump circuit communicating with said manifold conduit for drawing refrigerant therefrom, a pump within said pump circuit, a condenser within said pump circuit liquifying refrigerant passing therethrough, a reservoir receiving said liquified refriger-

ant from said condenser, refrigerant purifying means selectively communicating with said reservoir for receiving refrigerant therefrom, heating means heating said refrigerant purifying means controlling the temperature of purified refrigerant,



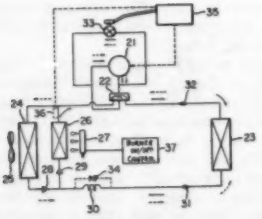
control means controlling said heating means, and a metering gear pump selectively communicating with said purifying means and said manifold conduit transferring refrigerant from said purifying means to said manifold conduit.

4,441,331

AIRCONDITIONER WITH REFRIGERANT TEMPERATURE RESPONSIVE CONTROLLER FOR COMPRESSOR BYPASS VALVE

Hiroshi Yuyama, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 372,239
Claims priority, application Japan, May 7, 1981, 56-68553
Int. Cl.³ F25B *41/00, 29/00*
U.S. Cl. 62—196.3 **3 Claims**



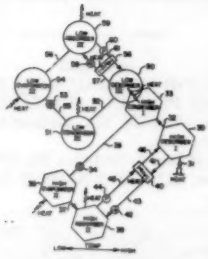
1. A heat pump type airconditioner comprising refrigerant compression means; a first heat exchanger disposed indoors and which functions as an evaporator during a cooling mode of operation and as a condenser during a warming mode of operation; a second heat exchanger disposed outdoors and which functions as a condenser during the cooling mode of operation; a third heat exchanger for heating the refrigerant during the warming mode of operation to increase the temperature thereof to a temperature higher than the outdoor air; heating means operatively associated with said third heat exchanger for providing heat to the third heat exchanger and having means for turning said heating means off when a higher predetermined refrigerant temperature is reached and turning said heater means on when a lower predetermined refrigerant temperature is reached; said compression means and heat exchangers being connected in a refrigeration circuit for operating in the cooling mode and the warming mode when refrigerant is circulated therethrough in the proper direction; a compression means bypass pipe connected between the higher pressure side and the lower pressure side of said compression means; valve means connected in said bypass pipe for controlling the flow of refrigerant through said bypass pipe; temperature sensing means on the outlet side of said third heat exchanger for sensing the temperature of the refrigerant from said third heat exchanger during the warming mode operation when said heating means is operating; and control means to which said temperature sensing means is connected and connected to said valve means for closing said valve means during normal cooling mode operation and keeping said valve means open at the start of the warming mode of operation and responsive to said temperature detecting means for closing said valve means when a higher predetermined sensed temperature of the refrigerant is reached and opening said valve means when a lower predetermined sensed temperature is reached.

4,441,332

ABSORPTION REFRIGERATION AND HEAT PUMP SYSTEM

William H. Wilkinson, Upper Arlington, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed Dec. 6, 1982, Ser. No. 446,885
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.3 **10 Claims**



1. An absorption refrigeration and heating system in connection with a cooling or heating load and a heat sink or source to selectively provide heat to or remove heat from the load, comprising:

(a) at least one first subsystem for operation at higher temperature and at least one second subsystem for operation at lower temperature relative to the first subsystem;

(b) each subsystem having components of absorber means, desorber means, condenser means, and evaporator means operatively connected together;

(c) with the condenser means of the higher temperature subsystem in heat exchange relationship with the desorber means of the lower temperature subsystem; and

(d) means to selectively arrange heat exchange relationships between the load and at least two of the component means including the higher temperature absorber, higher temperature evaporator, lower temperature condenser, lower temperature evaporator, and lower temperature absorber, while arranging heat exchange relationships between at least one of the other component means and the heat sink or source.

4,441,333

TRANSPORT REFRIGERATION UNIT COMBINATION AIRFLOW STRAIGHTENER AND DEFROST DAMPER

Donald K. Mayer, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jul. 15, 1982, Ser. No. 398,528
Int. Cl.³ B60H *3/04*
U.S. Cl. 62—239 **3 Claims**

1. A transport refrigeration unit serving a vehicle load space, including:

a refrigerant evaporator coil;

means for drawing air from said load space and passing said

air through said coil and directing said air back to said space;

means defining a passage through which air is directed back into said load space from said unit, said passage means having a generally rectangular shape in planes parallel to the direction of airflow;

means for defrosting said coil periodically;

honeycomb-like air straightener means in assembly form located in said passage, said assembly form having a generally rectangular shape in cross-section parallel to the direction of airflow with two opposite corner portions rounded to permit rotation of said assembly 90° within said passage means;

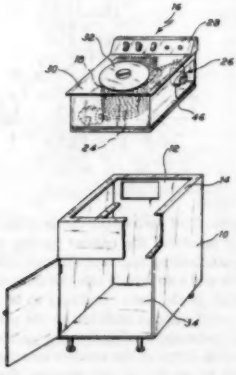
means for moving said assembly between one position in which said air straightener means are oriented to direct air out of said passage into said load space and an opposite position in which said air straightener means are oriented to block airflow through said passage and function as an airflow damper.

4,441,334

ICE-CREAM MACHINE

Alberto Cipelletti, Via Emilia, Guardamiglio, Italy

Filed Mar. 8, 1982, Ser. No. 355,293
Claims priority, application Italy, Mar. 10, 1981, 21032/81[U]
Int. Cl.³ F25D 23/12
U.S. Cl. 62—258 **7 Claims**



1. A multiple use cooling apparatus comprising in combination:

(a) an enbloc ice cream machine having self contained refrigerating means, with a refrigerating circuit associated therewith, and with said enbloc ice cream machine having a support plate fixed to the top thereof, and said support plate having an opening therein providing communication with a mixing container of said enbloc ice cream machine;

(b) furniture means having an opening at the top thereof, with said enbloc ice cream machine arranged in said opening and supported on top of said furniture means to project into said furniture means, and to define, with the inside walls of said furniture means, a free space thereunder;

(c) door means provided on said furniture means to provide selective access to said free space;

(d) insulating means arranged in said free space associated with said furniture means to define an insulated free space;

(e) refrigerating plate means located in said free space connected in parallel with said refrigerating circuit of said self-contained refrigerating means; and

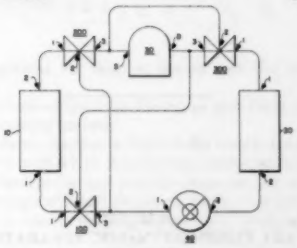
(f) valve means associated with said refrigerating plate means and with said refrigerating circuit for selectively connecting said refrigerating circuit to said refrigerating plate, for when said ice cream machine is not in use, for cooling said insulated free space.

4,441,335

HEAT PUMP

Ulrich Bonne, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 19, 1982, Ser. No. 409,733
Int. Cl.³ F25B 13/00
U.S. Cl. 62—324.6 **13 Claims**



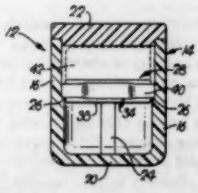
1. A reversible refrigeration system comprising a compressor, first and second heat exchangers, an expansion valve, three three-way valves, and means for connecting the elements of the system so that the system will operate in a heating mode with the three three-way valves adjusted for heating operation, in a cooling mode with the three three-way valves adjusted for cooling operation, and in a defrost mode with the three three-way valves adjusted for defrost operation.

4,441,336

COOLER HAVING FREEZE BOTTLE INSERT

John P. Cannon, Overland Park, Kans., assignor to Plattner Industries, Inc., Ottawa, Kans.

Filed Aug. 23, 1982, Ser. No. 410,579
Int. Cl.³ F25D 3/08
U.S. Cl. 62—457 **4 Claims**



1. A portable cooler including:

a hollow chest having a top lid adapted to be opened for rendering the interior of the chest accessible;

a closed, ice-filled bottle for local application of cold to the

contents of a plurality of individual containers to be placed in said chest; and

means in the chest for retaining the bottle in a preselected position within the chest,

said bottle having a corrugated, outer surface, presenting a series of spaced, elongated concavities,

each cavity conforming in shape with the outer configuration of a corresponding container to be placed in the chest, whereby the containers directly engage the bottle in the concavities both longitudinally and transversely of the concavities,

said bottle being waterproof whereby, as the ice melts in response to absorption of the heat of said container contents, the resultant liquid will be retained in the bottle,

said chest having upwardly-facing shoulder means intermediate said lid and the bottom of the chest for supporting the bottle horizontally in the chest,

said surface of the bottle facing upwardly when the bottle is resting on said shoulder means,

said chest having a pair of opposed walls,

each wall having an internal, upright, bottle-receiving groove for optional support of the bottle vertically in the chest.

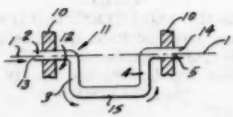
4,441,337
ROTARY THERMODYNAMIC APPARATUS AND METHOD

Frederick W. Kantor, 523 W. 112 St., New York, N.Y. 10025

Division of Ser. No. 240,135, Mar. 3, 1981, Pat. No. 4,367,639, which is a continuation of Ser. No. 4,606, Jan. 18, 1979, abandoned, which is a division of Ser. No. 770,316, Feb. 18, 1977, Pat. No. 4,136,530, which is a division of Ser. No. 569,478, Apr. 18, 1975, Pat. No. 4,010,018, which is a continuation of Ser. No. 78,552, Oct. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 864,112, Oct. 6, 1969, Pat. No. 3,808,828. This application Jan. 10, 1983, Ser. No. 456,709

Int. Cl.³ F25B *3/00*

U.S. Cl. 62—499 **15 Claims**



1. An absorptive rotary inertial thermodynamic compressor comprising, in combination, a rotor, means for admitting a gas into said rotor, a quantity of absorbent liquid in said rotor for absorbing said gas, an absorbing chamber for containing some of said liquid and for causing said incoming gas to be absorbed into said liquid, a heating chamber located radially outwardly from said absorbing chamber, first conduit means for conducting liquid from said absorbing chamber to said heating chamber, a separation chamber located radially inwardly from said heating chamber, second conduit means for conducting fluids from said heating chamber to said separating chamber, said separating chamber having a compressed gas outlet and a liquid outlet, said liquid outlet being located radially outwardly from said gas outlet, and third conduit means connecting said liquid outlet to said absorbing chamber.

4,441,338
PRESSER FOOT DEVICE FOR A KNITTING MACHINE

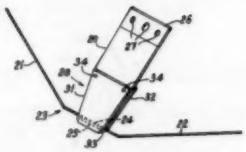
Max W. Betts, Falmouth, and Frank Robinson, Derby, both of England, assignors to Courtaulds PLC, London, England

Filed May 19, 1983, Ser. No. 496,096

Claims priority, application United Kingdom, May 19, 1982, 8214622

Int. Cl.³ D04B *7/04*

U.S. Cl. 66—64 **9 Claims**



1. A presser foot device for a knitting machine comprising:

(a) a blade-like support which, when mounted in the knitting machine, extends downwardly with respect to the needles of the machine,

(b) a presser element carried by said support near its lower edge,

(c) and a channel-like protective element which enfolds the lower edges of the blade-like support to protect it.

4,441,339
TWO-PIECE YARN CARRIERS FOR CIRCULAR KNITTING MACHINES

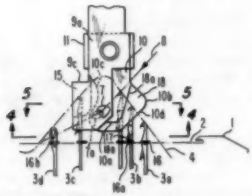
Shozo Yorisue, Kobe, Japan, assignor to Precision Fukuhara Works, Ltd., Kobe, Japan

Filed Feb. 16, 1982, Ser. No. 348,704

Claims priority, application Japan, Apr. 6, 1981, 56-049489[U]

Int. Cl.³ D04B *15/08, 15/54*

U.S. Cl. 66—111 **10 Claims**



1. A yarn carrier to feed yarn to the circle of latch needles of a circular knitting machine, the carrier having a yarn guide provided with a yarn feeding aperture through which the yarn is fed to the needles and into which random ones of the needles are adapted to enter as the yarn continues to be fed, and the carrier having a guard plate in addition to the yarn guide, the guard plate being operatively related to the yarn guide and to the needles to prevent entry of the needles into the aperture as the yarn continues to be fed to the needles, the yarn being spaced from the guard plate as it is fed to the needles.

4,441,340
ENERGY SAVING LAUNDRY SYSTEM

Darryl Kaplan, P.O. Box 1, Woodridge, N.Y. 12789

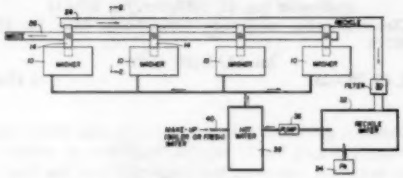
Filed Feb. 18, 1982, Ser. No. 349,996

Int. Cl.³ D06F *31/00, 39/08*

U.S. Cl. 68—12 R **19 Claims**

11. A water and heat energy conservation system for a laundry of the type which comprises a plurality of individual

automatically operated washing machines and a single hot water supply for all of said machines, the combination comprising a modular substantially self-contained system comprising an array of a hot water storage tank, a recycle water tank, and a waste water storage tank, diverter valve means associated with the water effluent exit of each of said washing machines for selectively directing the water effluent from every bath during the cycle of the operation of each of said machines into either said recycle water tank or said waste water tank, said diverter valve means comprising a housing positioned



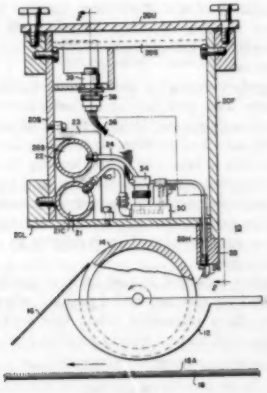
over and overlying portions of both of said waste water tank and said recycle water tank, said diverter valve means further comprising an "L" shaped diverter valve member which in one position directs the effluent flow from the machine into one of said tanks and in the other position of said valve directs the effluent flow into the other of said waste water tank and said recycle water tank, means to supply water from said recycle water tank to said hot water storage tank, and means to supply hot water from said hot water storage tank to each of said washing machines.

4,441,341

APPARATUS FOR TREATING TEXTILE MATERIALS

Billy J. Otting, Lafayette, Ga., assignor to Otting International, Inc., Lafayette, Ga.

Filed Mar. 23, 1982, Ser. No. 361,037
Int. Cl.³ D06B 1/06
U.S. Cl. 68—205 R **15 Claims**



1. Apparatus for dyeing a continuously moving textile web comprising

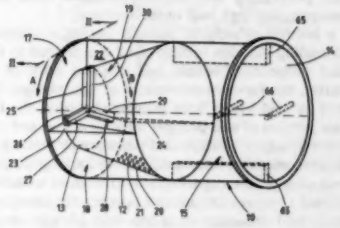
a roll applicator extending the width of the moving textile web and adapted to be mounted above the moving textile web, said roll applicator including a trough for supplying liquid dye, a roller mounted for rotation in said trough and adapted to pick up the dye in a film on a surface of the roller upon rotation of the roller, a doctor blade adjacent said roller and inclined downwardly away from said roller for transferring dye from said roller to said web, and a plurality of spaced spray jets for spraying gaseous fluid on said roller to rearrange said dye film.

4,441,342

TANNING APPARATUS

Ludwig Dose, Vogesenstr. 8, and Werner Dose, Greffernerstr. 16, both of D-7585 Lichtenau, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,678
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029856
Int. Cl.³ D06B 5/24, 23/14
U.S. Cl. 69—30 **27 Claims**



1. An apparatus for tanning, dyeing and like treatment, comprising:

(a) a horizontal rotary drum having an axial front end and a circumferential surface;

(b) a treatment chamber defined in the rotary drum;

(c) a hollow axle which is in communication with the treatment chamber for carrying the drum and for admission and drainage of liquid treatment media, said hollow axle having an interior defining a plurality of axially extending channels;

(d) at least two ring-pocket sections provided along the circumferential surface of the drum, each of the two ring-pocket sections being in communication with the treatment chamber; and

(e) connecting lines communicating with the individual ring-pocket sections and provided only at the axial front end of the rotary drum for admission and drainage of the liquid treatment media so that the interior of the treatment chamber and of the other axial front end of the rotary drum are free of connecting lines, each of said connecting lines extending substantially radially between the drum center of the axial front ends and the associated ring-pocket section and having one end opening into the interior of the associated ring-pocket section and another end arranged in the region of the center opening into the respectively associated axial channels in the interior of the hollow axle, wherein each ring-pocket section communicates with two connecting lines, the one of which being provided in the circumferential direction of the rotary drum at one end of the respective ring-pocket section and the other of which being provided in the circumferential direction at the other end thereof, so that regardless of the rotation of the drum, the liquid treatment media is admitted into one of the two connecting lines of the associated ring-pocket section.

4,441,343

HIGH SECURITY LOCKS AND KEY

Anker J. Nielsen, Jr., Holden, and Richard E. Hoyt, Worcester, both of Mass., assignors to Omco Inc., Holden, Mass.

Filed Jul. 1, 1982, Ser. No. 394,446
Int. Cl.³ E05B 67/36, 25/00
U.S. Cl. 70—34 **7 Claims**

7. A high security lock comprising:

(a) a hollow cylindrical lock barrel having a closed front end

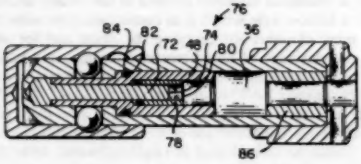
and an apertured rear end, said lock barrel having a stepped axially extending bore, the front bore having a relatively small diameter and the rear bore having a relatively large diameter;

(b) said stepped barrel bore having an annular shoulder forming the junction between said front bore and said rear bore, the surface of said annular shoulder extending at an angle to the axis of said barrel bore, said annular shoulder acting as a plunger seat;

(c) at least two radially extending passageways running from the exterior surface of said lock barrel to the front bore of said lock barrel, and a locking member movably mounted in each said passageway, the outer aperture of each said passageway having a small inwardly extending peripheral rim preventing said locking member from completely escaping through said outer aperture;

(d) a hollow cylindrical plunger having a stepped axially extending exterior surface sized and shaped to slidably fit and reciprocate within said stepped bore of said lock barrel, the forward movement of said plunger being limited by said barrel bore annular shoulder, the front exterior portion of said plunger moving across and closing the inner aperture of each said passageway forcing each said locking member outwardly to its locking position when said plunger moves forwardly, the front exterior portion of said plunger clearing and opening the inner aperture of each said passageway when said plunger moves rearwardly;

(e) said hollow plunger having open front and rear ends and a stepped axially extending bore, the front bore having a relatively small diameter and the rear bore having a relatively large diameter;



(f) said stepped plunger bore having an annular shoulder forming the junction between said front bore and said rear bore, the surface of said annular shoulder extending perpendicular to the axis of said plunger bore, and acting as a seat;

(g) resilient friction-producing means seated against said plunger bore annular shoulder, and a hollow cylindrical open-ended retainer sleeve fixed against axial movement within said rear bore of said plunger forcing and maintaining said friction-producing means against said plunger bore annular shoulder; and

(h) a center pin having an enlarged head at its front end and a rearwardly extending shaft, said center pin head having an outer diameter corresponding to the outer diameter of the front exterior portion of said plunger, said center pin shaft having an outer diameter corresponding to and being slightly smaller than the inner diameter of said front bore of said plunger, said center pin shaft extending rearwardly through said open front end of said plunger and reciprocating within said plunger bore;

(i) said resilient friction-producing means gripping the periphery of said center pin shaft and yieldably resisting center pin reciprocal movement within said plunger bore;

(j) said plunger moving to its forward position when an authorized key is fully inserted, said plunger forcing said locking members outwardly to their locking position; said plunger moving to its rearward position and said center pin being maintained in its forward position when the authorized key is fully inserted and operated, said rearwardly positioned plunger and said forwardly positioned center pin permitting said locking members to fall to their inward unlocking position; said plunger moving to its rearward position and said center pin following said plunger to the rearward position of said center pin when an unauthorized key or pick is inserted and operated, said rearwardly positioned center pin head maintaining said locking members in their outward locking position.

4,441,344

ATTACHMENT MEANS PROVIDED WITH A LOCK

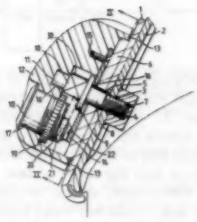
Cornelis Kurpershoek, Bussum, Netherlands, assignor to Industri AB Thule, Hillerstorp, Sweden

Continuation of Ser. No. 213,195, Dec. 4, 1980, abandoned. This application Sep. 16, 1983, Ser. No. 533,041

Claims priority, application Netherlands, May 12, 1979, 7908770

Int. Cl.³ F16B *41/00*

U.S. Cl. 70—231 **8 Claims**



1. An attachment device including a lock and a rotatable member for attaching and releasing purposes, comprising:

a knob having outer and inner faces,

an attachment member having an end portion rotatably mounted in the inner face of said knob,

retaining means to retain said end portion in said knob,

a locking head on said end portion having a plurality of discrete locking faces,

a lock mounted in said knob accessible from the outer face thereof and eccentrically with respect to the axis of relative rotation of said attachment member and knob,

a locking member operated by said lock for movement relative to said locking head between locking and unlocking positions,

a locking face engaging part on said locking member engageable with and having a configuration substantially conforming with said locking face so that when said lock is in the unlocked position, said locking face engaging part coacts with at least one of said locking faces to positively prevent relative rotation between said knob and attachment member, and in the locked position said locking face engaging part is out of engagement with said locking faces to allow rotation of said knob relative to said attachment member, and

a leaf spring mounted in said knob to resiliently urge said head locking member into a position where said discrete locking faces releasably retain said knob from relative rotation with respect to said locking head.

4,441,345

LOCK DEVICE FOR VEHICLE HOODS

David A. Guarr, 6130 Westgate, Shawnee, Kans. 66216

Filed Jan. 19, 1982, Ser. No. 340,649

Int. Cl.³ E05B *65/12*; E05C *3/04*

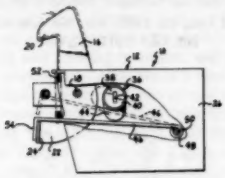
U.S. Cl. 70—240 **8 Claims**

1. A locking device for a hood of a vehicle having a latch for releasably holding the hood closed and a movable release lever for releasing the latch to permit opening of the hood, said device comprising:

a bracket adapted to be mounted on the vehicle at a location adjacent the release lever;

lock means on said bracket including a plug supported on the bracket for rotational movement between a locked position wherein the plug is held against movement and an unlocked position;

key means for effecting movement of said plug between the locked and unlocked positions thereof; and



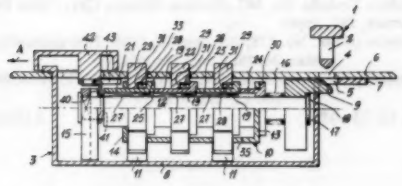
cam means associated with said plug and acting in camming fashion in response to rotation of said plug to physically hold said release lever against movement when said plug is rotated to the locked position, thereby preventing release of the latch, said cam means releasing the release lever when said plug is rotated to the release position to permit movement of the release lever, thereby permitting the latch to be released for opening of the hood.

4,441,346

COMBINATION LOCK WITH A SINGLE KNOB BOTH FOR CONTROLLING THE OPENING AND FOR CHANGING THE LOCK COMBINATION

Claudio Castiglioni, Varese, Italy, assignor to C.G.V. S.a.S. di Claudio Castiglioni & C., Italy

Filed Aug. 6, 1980, Ser. No. 175,903
Claims priority, application Italy, Sep. 7, 1979, 22488/79[U]
Int. Cl.³ E05B *37/02*
U.S. Cl. 70—312 **3 Claims**



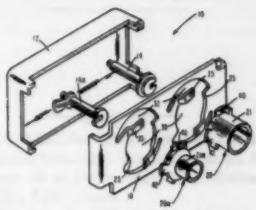
3. In a combination lock having setting discs which are arranged alongside of each other on a shaft, are turnable independently of each other and extend through slots in a front plate of a lock case, having a plurality of aligned locking sleeves associated with the setting discs, seated on the shaft and in spring-biased coupling engagement with the setting discs and formed with depressions which, when the combination number is correctly set, and located in a position opposite projections, and having an actuating handle arranged on the front plate, which handle can be displaced longitudinally from a basic position thereof in a direction toward an opening position of the lock in order to release a hasp which extends into inside of the lock case through an opening in the front plate and cooperates with a latch member, the actuating handle also for operatively displacing the locking sleeves out of their position of coupling engagement with the setting discs, the improvement comprising: said actuating handle is mounted displaceably from said basic position thereof in a displacement movement in a direction opposite the direction toward said opening position of the lock and constitutes means during said displacement movement for pushing the locking sleeves out of said position of coupling engagement.

4,441,347

LOCK ASSEMBLY WITH INTERCHANGEABLE NOSES FOR SAFE DEPOSIT BOXES

James L. Taylor, P.O. Box 4441, Lexington, Ky. 40544

Filed Jun. 8, 1981, Ser. No. 271,571
Int. Cl.³ E05B *9/08*; E04G *3/00*
U.S. Cl. 70—370 **14 Claims**



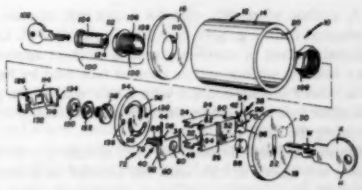
1. A lock mounting assembly for positioning different size insert lock guides of substantially cylindrical configuration in a safe deposit door or the like, comprising: a lock housing; a first lock guide having a substantially small diameter and a second lock guide having a relatively large diameter, a cover plate having cutout portions of substantially the same size for receiving the first and second insert lock guides; and retaining means for securing the guides to the cover plate including a universal mounting base on each guide and received in the corresponding cutout portions, each mounting base of the small and large lock guides having substantially the same size outer diameter to be received in said cutout portions, first and second locking elements spaced circumferentially from each other on each base, said first locking element engaging a top surface of the cover plate surrounding said cutout portion, said second locking element engaging a bottom surface of the cover plate.

4,441,348

KEY RETAINING DEVICE

Hildaur L. Neilsen, 2 Juniper St., Metuchen, N.J. 08840

Filed Nov. 17, 1981, Ser. No. 322,265
Int. Cl.³ E05B *11/00, 73/00*
U.S. Cl. 70—389 **14 Claims**



1. A key retaining device for capturing and selectively locking therein a portion of the working section of a key having a working section and a handle section, said device comprising:

housing means forming a chamber therein, a slot disposed through a wall of said housing means, said slot being in communication with said chamber and dimensioned to accomodate therethrough said portion of said working section of said key for insertion into said chamber; and

means for selectively securing said working portion of said key within said chamber, including

clamp means having an open and an engaging position, said clamp means comprising:

a plurality of key engaging members, each including a blade, the edge of which is engageable with said working section

of the key, and which by the resulting wedging action prevents withdrawal of said key from said slot, and

selective locking means comprising:

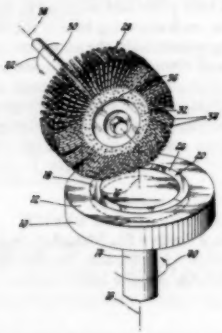
a master key and lock assembly mounted on said housing means, insertion of said master key into said lock assembly permitting the rotation of a member which moves the blades into and out of engagement with said working section of the key.

4,441,349

METHOD OF MAKING A CAST IRON SEALING RING

James D. Symons, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1982, Ser. No. 440,963
Int. Cl.³ B21D *31/06*
U.S. Cl. 72—53 **2 Claims**



1. A method of manufacture for a cast iron annular sealing ring adapted to fit a groove on a rotating shaft with the outer peripheral surface in stationary sealing contact against a stationary housing surface and an annular face held by hydraulic fluid in rotary sealing contact with a side wall of the groove, said annular face having a predetermined hardness, the method comprising the steps of:

mounting said annular seal ring in an annular groove formed in a workpiece holder with the annular face thereof exposed;

rotating said workpiece holder in the range of 90 to 110 revolutions per minute;

rotating a work tool, having a plurality of flexible flaps with a plurality of cast shot embedded therein, at a predetermined constant speed on an axis disposed perpendicular to the axis of said workpiece holder;

moving said workpiece holder into the path of the flaps of said work tool a predetermined distance to effect cold-working of the annular face of said seal ring, while maintaining the axis of the tool perpendicular to the workpiece axis and cooperating with said work tool rotation and surface hardness to produce an angle of incidence in the surface in the range of 2° to 3° and asperities with a radius of curvature in the range of 0.2 to 0.3 mm; and

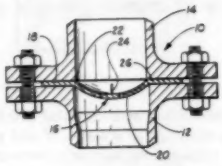
retracting said workpiece holder from the path of said flaps.

4,441,350

SCORED REVERSE BUCKLING RUPTURE DISK MANUFACTURING METHOD

Edward H. Short, III; Jerome D. Allen, both of Tulsa, Okla., and Loren E. Wood, deceased, Tulsa, Okla. (by Anna L. Wood, executrix), assignors to BS&B Safety Systems, Inc., Tulsa, Okla.

Filed Dec. 15, 1981, Ser. No. 330,809
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—55 **8 Claims**



1. An improved method of manufacturing a group of scored reverse buckling rupture disks of desired reversal rupture pressure from sheet metal comprising the steps of:

(a) dividing said sheet metal into a plurality of sections;

(b) forming a concave-convex dome in each of said sheet metal sections; and

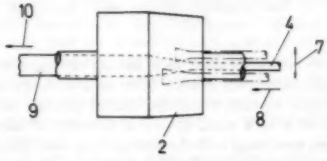
(c) forming identical scores of predetermined depth on a surface of each of said concave-convex dome portions of said sheet metal sections thereby creating identical lines of weakness therein, said scores radiating outwardly and having a greater depth, at the central portions of the radii of said concave-convex dome.

4,441,351

METHOD OF AND APPARATUS FOR PRODUCING METALLIC TAPE

Keiichiro Yoshida, No. 641, Mobara, Mobara City, Chiba Prefecture, 297, Japan

Division of Ser. No. 178,635, Aug. 15, 1980. This application Mar. 24, 1982, Ser. No. 361,489
Claims priority, application Japan, Oct. 31, 1979, 54-141881
Int. Cl.³ B21B *13/18*
U.S. Cl. 72—189 **3 Claims**



1. An apparatus for producing metallic tape, comprising:

a machine frame;

a pair of support shafts mounted on said machine frame and extending parallel with each other;

a pair of rolling and pressing members each having a base rotatably mounted on a corresponding support shaft and each having a peripheral portion projecting substantially radially outwardly from said base with a peripheral working surface on the radially outer end thereof, said peripheral working surfaces the radially outer end thereof, said peripheral working surfaces of said rolling and pressing members being opposed to each other;

a pair of power input members operable in synchronism with each other and connected to respective ones of said rolling and pressing members for reciprocally rotating said rolling and pressing members past a position in which the

peripheral portions are aligned with each other between said parallel shafts;

a wire feed means for intermittently feeding a wire between said peripheral working surfaces parallel to said support shafts in a direction from an inlet side of said rolling and pressing members to an outlet side of said members;

a wire guiding member disposed on the inlet side of said rolling and pressing members; and

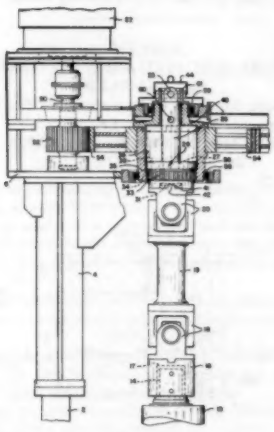
a product tape guiding member disposed on the outlet side of said rolling and pressing members, said guiding members being reciprocatingly movable in a direction perpendicular to a plane including the axes of said support shafts and in synchronism with the intermittent feeding of said wire for guiding the wire fed back and forth between said peripheral working surfaces in a direction perpendicular to said shafts, the distance between said peripheral working surface progressively decreasing at least part way across said peripheral working surfaces in the direction from said inlet side to said outlet side.

4,441,352

VERTICAL MILL

Andrew J. McDonagh, Pittsburgh, and Charles B. Duke, Clairton, both of Pa., assignors to Mesta Engineering Company, Pittsburgh, Pa.

Filed Jan. 21, 1982, Ser. No. 341,205
Int. Cl.³ B21B *35/14, 35/00, 31/08*
U.S. Cl. 72—249 **7 Claims**



1. A vertical rolling mill comprising:

(a) a housing,

(b) a plurality of mill rolls rotatably mounted on the housing in a substantially vertical position, and

(c) a drive means for each roll comprising

(i) a rigid spindle,

(ii) an upper joint and a lower joint attached to the spindle,

(iii) a detachable coupling connected to the lower joint and movably attached to the roll,

(iv) a substantially hollow cylindrical sleeve having longitudinal interior splines at one end and an interior shoulder about its interior,

(v) a vertical spline shaft having a collar and splines at one end and sized so that the splines will fit into the sleeve and engage its splines, and the collar will rest on the sleeve shoulder and attached at splined end to the upper joint,

(vi) a support member attached to the rolling mill, positioned substantially above the mill roll, and on which the sleeve rests, having an aperture sized so that the sleeve will not pass through the aperture and the spline shaft can be connected to the upper joint through the aperture, and

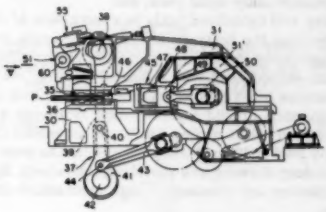
(vii) means connected to said sleeve for rotating the spindle.

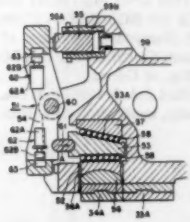
4,441,353

CLAMP MECHANISM FOR UPSETTER

Akira Asari, Osaka; Takashige Yamamura, Kobe, and Tsuneya Veno, Takasago, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 27, 1982, Ser. No. 343,218
Claims priority, application Japan, Jan. 29, 1981, 56-13495
Int. Cl.³ B21D *7/06*
U.S. Cl. 72—316 **5 Claims**





1. An upsetter having a clamp mechanism comprising a row of a plural N-number of split dies where N is an integer greater than 1 and where each split die further comprises an upset die and a clamp die, a grip mechanism for opening and closing said dies by relative movement toward and away from each other, and an upset mechanism including a plurality of punches retractably protrudable into said dies, said clamp mechanism comprising:

a plural N-number of pressurizing cylinders, one cylinder positioned opposingly to each of the respective split dies;

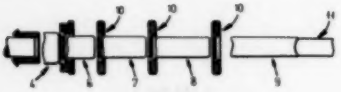
operating link means which further comprise a plurality of like members for transmitting power, each of said like members transmitting the power one of said pressurizing cylinders separately to the clamp die of one of said respective split dies; and

(N−1) coupling means for selectively interlocking said operating link members to transmit the combined power of said N-number of pressurizing cylinders to up to N number of said clamp dies, each said coupling means being positioned and constructed for selectively interlocking two adjacent ones of said operating link members.

4,441,354
PROCESS FOR MANUFACTURING THIN UNITARY HOLLOW METAL BODIES

Sergio Bodega, Abbadia Lariana, Italy, assignor to Tubettificio Ligure S.p.A., Abbadia Lariana, Italy

Filed Oct. 22, 1981, Ser. No. 314,048
Claims priority, application Italy, Nov. 28, 1980, 26290 A/80
Int. Cl.³ B21B *22/00*
U.S. Cl. 72—342 3 Claims



1. A process for manufacturing a one-piece hollow body of an aluminum alloy, for use mainly as a pressure container, consisting of a cylindrical body having a concave dished bottom and of a dome-shaped head, said process comprising the steps of:

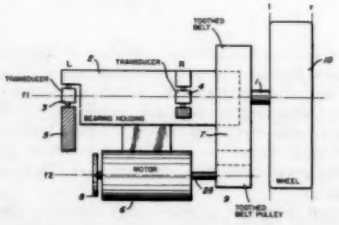
deep drawing and stretching said cylindrical body from an aluminum alloy metal plate; and

tapering said cylindrical body in a succession of dies, while subjecting the body to a thermal treatment capable of transforming the upper part of said cylindrical body into a dome-shaped head with a beaded opening, said tapering operation being effected by at least 12 successive tapering steps, each of said tapering steps involving a diameter reduction not exceeding 4 mm, said aluminum alloy being alloy 3004 H 19, such alloy being suited to assume, during said deep drawing and stretching operations, high strain-hardening and consequent high mechanical characteristics.

4,441,355
APPARATUS AND METHOD FOR DISPLAYING UNBALANCE OF ROTORS DURING MEASUREMENT

Karl Rothamel, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,784
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026232
Int. Cl.³ G01M *1/22*
U.S. Cl. 73—1 R 12 Claims



1. An apparatus for displaying the amount of unbalance during measurement of a rotor in two correction planes, said apparatus comprising:

measuring means for measuring unbalance forces of the rotor and for measuring unbalance forces of known magnitude during measuring of the unbalance forces of the rotor;

comparing means for comparing the measured unbalance forces of known magnitude with predetermined nominal data to obtain a comparison result; and

adjusting means for adjusting the measured amounts of unbalance of the rotor in accordance with the comparison result;

said measuring means comprising:

a motor-driven shaft on which said rotor is mounted for rotation at a first rotational speed;

a rotating unbalance exciter for generating said unbalance forces of known magnitude, said rotating unbalance exciter operating in accordance with a rotational frequency different from said first rotational frequency of said rotor;

a pair of transducers, one for each of said two correction planes, for receiving said unbalance forces of the rotor and said unbalance forces of known magnitude, and providing said unbalance forces of the rotor and said unbalance forces of known magnitude as outputs;

two pairs of measuring channels, one pair for each of said two correcting planes, a first measuring channel of each said pair of measuring channels receiving and measuring the unbalance forces of said rotor to provide to said adjusting means measured unbalance force outputs comprising the measured amounts of unbalance of the rotor, and a second measuring channel of each said pair of measuring channels receiving and measuring said unbalance forces of known magnitude to provide to said comparing means measured unbalance force outputs comprising said measured unbalance forces of known magnitude;

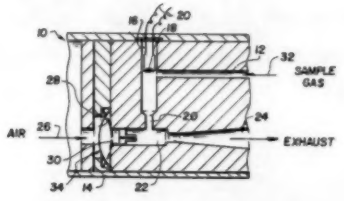
an auxiliary shaft parallel to the motor-driven shaft, said rotating unbalance exciter being mounted on said auxiliary shaft; and

a driving motor of said motor-driven shaft, and wherein said auxiliary shaft is a part of said driving motor.

4,441,356
TEMPERATURE ACTUATED AIR FLOW CONTROL AND GAS SAMPLER

Thomas L. Bohl, Madison, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 29, 1982, Ser. No. 362,926
Int. Cl.³ G01N *1/24, 27/14*
U.S. Cl. 73—23 6 Claims



1. A temperature actuated fluid flow control, comprising a fluid inlet, an exhaust line for the fluid connected to said fluid inlet, a reduced flow area section in the connection of said exhaust line to said fluid inlet, an aspirating fluid connection line extending into the connection adjacent said reduced area for supplying aspirating fluid to induce flow of fluid into said inlet and out said exhaust line, said aspirator fluid connecting line having a throughflow chamber with an opening for the passage of the aspirating gas, a bimetallic valve plate disposed in said chamber and overlying the opening and being flexible and responsive to temperature change so that in a first flexed position it closes the opening to stop the flow of aspirating gas whenever the dewpoint temperature of the fluid is reached and movable to another flexed position by temperature change to open the opening whenever the fluid temperature is above the dewpoint of the fluid.

4. A temperature actuated fluid flow control comprising a housing defining a heated block, a gas sensor disposed in said housing, a fluid inlet, an exhaust line for fluid connected to said fluid inlet with said gas sensor being connected to both said fluid inlet and said fluid outlet, a reduced flow area section in

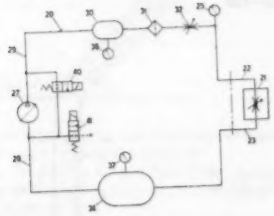
the connection of said exhaust line to said fluid inlet, an aspirating fluid connection line extending into the connection adjacent said reduced area for supplying aspirating fluid to induce flow of fluid into said inlet and out said exhaust line, said aspirator fluid connecting line having a throughflow chamber with an opening for the passage of the aspirating gas, a bimetallic valve plate disposed in said chamber and overlying the opening and being flexible and responsive to temperature change so that in a first flexed position it closes the opening to stop the flow of aspirating gas and movable to another flexed position by temperature change to open the opening, and said aspirating gas comprising air.

4,441,357

PRESSURE MONITORING AND LEAK DETECTION METHOD AND APPARATUS

Alan R. Kahn, Madison; Kenneth R. Clark, Cottage Grove, and Dennis E. Bahr, Middleton, all of Wis., assignors to Meadox Instruments, Inc., Oakland, N.J.

Filed Mar. 4, 1982, Ser. No. 354,610
Int. Cl.³ G01N *3/02*; A61B *5/00*
U.S. Cl. 73—40 **23 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 68 Pages)



1. In a closed circulating gas system having a pump which draws gas at an inlet from a return line and delivers gas under pressure at an outlet to a supply line, and also having a load device which receives gas from the supply line and delivers it to the return line, apparatus for detecting leaks in the system comprising:

(a) a first accumulator chamber connected in the supply line;

(b) a second accumulator chamber connected in the return line;

(c) first pressure transducer means for measuring the pressure in the first accumulator chamber and providing an output signal indicative thereof;

(d) second pressure transducer means for measuring the pressure in the second accumulator chamber and providing an output signal indicative thereof;

(e) control means responsive to the output signals of the first and second pressure transducer means for comparing the pressure measured in the first accumulator chamber with the pressure measured in the second accumulator chamber and providing a leak warning output signal if the compared pressures change with respect to one another in excess of a selected range, thereby indicating that the flow through the two accumulator chambers is not equal and a leak in the system has occured;

(f) a load device comprising a pressure sensor connected between the supply and return lines which includes:

(1) a cup-shaped housing having an open mouth and having an inlet and an outlet formed therein;

(2) a flexible diaphragm sealed over the open mouth of the housing to define a plenum between the walls of the mouth in the housing and the diaphragm, and wherein the inlet formed in the housing is in communication with the plenum;

(3) an exhaust tube centrally mounted in the housing within the plenum with an end thereof terminating adjacent the inner side of the diaphragm and connected to be in communication with the outlet from the housing, the supply line being connected to the inlet to the housing and the return line being connected to the outlet from the housing;

(g) a flow restrictor connected in the supply line between the first accumulator chamber and the pressure sensor;

(h) load pressure transducer means for measuring the pressure in the supply line between the restrictor and the pressure sensor and providing an output signal indicative thereof which is supplied to the control means; and

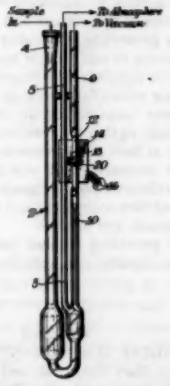
(i) the control means also providing a display to an operator of the pressure measured by the load pressure transducer means.

4,441,358

AUTOMATED ULTRASONIC SOLUTION VISCOMETER

Robert L. Osborne, 302 Chatham St., Avondale, Pa. 19311

Filed Dec. 7, 1981, Ser. No. 328,376
Int. Cl.³ G01N *11/06*
U.S. Cl. 73—55 **5 Claims**



1. Apparatus for automatically measuring the viscosity of a liquid comprising:

(a) a viscometer tube having an inlet and an outlet and a time-interval measuring zone,

(b) at least two sets of ultrasonic transducers, one sending transducer and one receiving transducer per set, mounted so as to transmit sound waves through said time-interval measuring zone and any liquid contained therein, one transducer set being mounted at a desired distance downstream in the flow path from the other transducer set, thereby to sense the passage or absence of liquid said measuring zone as a result of the variation in sound absorption by said liquid and air,

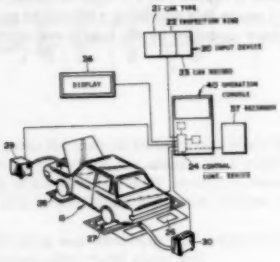
(c) sonic timing means connected to said transducers to measure the time-interval between the time a liquid meniscus in said tube passes one set of transducers and the time said meniscus passes the second set of transducers, and

(d) sequence control means for automatically directing the flow of said liquid into and through said viscometer and energizing said sonic timing means.

4,441,359
METHOD AND APPARATUS FOR INSPECTING VEHICLES

Mitsuhiko Ezoe, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 3, 1982, Ser. No. 354,449
Claims priority, application Japan, Mar. 4, 1981, 56-29796
Int. Cl.³ G01M 15/00
U.S. Cl. 73—117 18 Claims

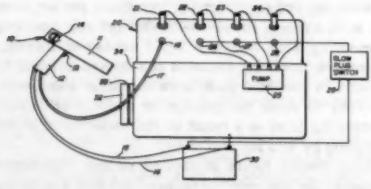


1. An apparatus for inspecting vehicles comprising:
(a) means for generating vehicle type signals indicative of the type of vehicle being inspected,
(b) means for measuring a plurality of vehicle parameters and generating vehicle measurement signals indicative thereof,
(c) means for generating additional vehicle signals indicative of at least one of vehicle age and mileage,
(d) means for generating a plurality of reference value signals in response to said vehicle type signals and said additional vehicle signals, said reference value signals indicating reference values for the measured vehicle parameters, said reference value signals depending on the additional vehicle signals so that the reference values vary in accordance with at least one of vehicle age and mileage,
(e) means for comparing said vehicle measurement signals with said reference value signals for generating one of vehicle condition acceptable and vehicle condition unacceptable signals, and
(f) means for providing a visual indication of said vehicle condition acceptable and vehicle condition unacceptable signals.

4,441,360
ENGINE TIMING INSTRUMENT

Daniel J. Dooley, Burr Ridge, Ill., and Warren L. Williamson, Mesa, Ariz., assignors to Creative Tool Company, Burr Ridge, Ill.

Filed Mar. 12, 1982, Ser. No. 357,638
Int. Cl.³ G01M 15/00
U.S. Cl. 73—119 A 22 Claims

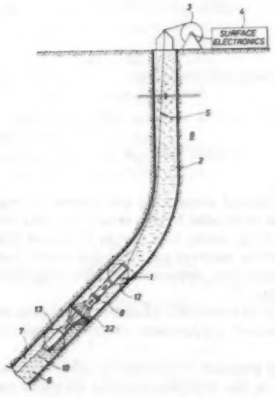


11. An instrument for timing of an engine which includes a crankshaft rotatable through a certain integer number of revolutions during an engine operating cycle, at least one cylinder, and a piston in said cylinder coupled to said crankshaft to be moved through a top dead center position during each revolution of said crankshaft, said instrument comprising: firing pulse means for developing a firing pulse during each engine operating cycle, reference pulse means for developing a reference pulse during each engine operating cycle and at a time in advanced relation to a corresponding firing pulse, and delay measuring means for measuring the elapsed time between one of said reference pulses and an immediately following one of said firing pulses, at least one of said pulse means comprising transducer means responsive to the pressure in said cylinder for producing a corresponding electrical signal.

4,441,361
METHOD AND APPARATUS FOR MEASUREMENT OF FLUID DENSITY AND FLOW RATES IN MULTI-PHASE FLOW REGIMES

Norman R. Carlson; Raymond E. Roesner, both of Houston, and Edward W. Lanuke, Spring, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 2, 1981, Ser. No. 307,714
Int. Cl.³ E21B 47/00; G01F 13/00
U.S. Cl. 73—155 16 Claims

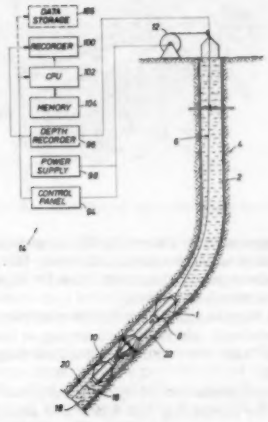


16. A method of measuring the flow rates of the individual phases of a fluid flow regime having at least two phases, comprising the steps of:
mixing at least a portion of the flow to produce a mixture of substantially uniform composition;
measuring the density of said mixture of substantially uniform composition;
determining the volumetric fraction of each phase of said mixture of substantially uniform composition at least in accordance with the measured mixture density;
measuring the flow rate of said mixture of substantially uniform composition; and
determining the flow rate of each phase of the flow regime, said flow rate of each phase determined by;
determining a correction term to account at least for the effect of slippage between the phases of said fluid flow regime in accordance with the measured density of the individual phases of said flow regime; and
measuring the flow rates of the phases of said flow regime at least in accordance with the measured flow rate of said mixture, each phase's volumetric fraction of said mixture and the correction term accounting for at least the effect of slippage between the phases.

4,441,362
METHOD FOR DETERMINING VOLUMETRIC FRACTIONS AND FLOW RATES OF INDIVIDUAL PHASES WITHIN A MULTI-PHASE FLOW REGIME

Norman R. Carlson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 19, 1982, Ser. No. 369,945
Int. Cl.³ E21B 47/00
U.S. Cl. 73—155 26 Claims

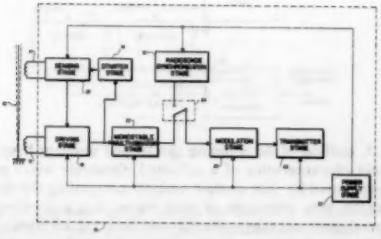


1. A method for determining characteristics of a multi-phase fluid flow regime, comprising the steps of:
(a) measuring the density of said fluid flow regime;
(b) measuring dielectric response characteristics of said fluid flow regime; and
(c) establishing a functional relationship between said dielectric response characteristics measurement of said fluid flow regime and the volumetric fraction of at least one phase of said fluid flow regime, said functional relationship established in reference to said measured density of said fluid flow regime.

4,441,363
APPARATUS AND METHOD FOR MEASURING CONCENTRATIONS OF SUPERCOOLED LIQUID WATER

Geoffrey E. Hill; Duard S. Woffinden, both of Logan, and Duane G. Chadwick, North Logan, all of Utah, assignors to Utah State University Foundation, Logan, Utah

Filed Jul. 8, 1981, Ser. No. 281,435
Int. Cl.³ G01W 1/00, 1/08
U.S. Cl. 73—170 R 20 Claims

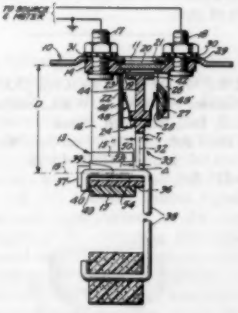


1. An apparatus for measuring concentrations of supercooled liquid water in an atmosphere comprising:
a wire which is fixed at one end and free at the other end for collecting supercooled liquid water, said wire and collected supercooled water having a natural frequency which decreases in relation to an increase in mass of supercooled water collected on the wire, the mass of the supercooled water collected on the wire being substantially proportional to the concentration of supercooled liquid water in the surrounding atmosphere;
means for vibrating the wire; and
means for sensing the natural frequency of the wire in combination with the mass of the collected supercooled water.

4,441,364
LIQUID-LEVEL TRANSDUCER/INDICATOR

Douglas L. Montie, Norwich, Conn., assignor to Thomas G. Faria Corp., Uncasville, Conn.

Filed May 22, 1981, Ser. No. 266,598
Int. Cl.³ G01F 23/10
U.S. Cl. 73—313 18 Claims



1. As an article of manufacture, a liquid-level sensing component comprising a baseplate having means for removably securing the same to close an opening in a tank within which liquid level is to be monitored, a bearing mount of insulating material having a base portion adapted to fit to the underside of said baseplate, two spaced terminal bolts extending through spaced openings in said plate and clamping said bearing mount thereto, at least one of said bolts being insulated from said plate, said bearing mount integrally including a journal-bearing formation establishing a pivot axis offset from and generally parallel to said plate, a conductive plate supported by said mount and having electrical connection to a first of said bolts, said conductive plate having an elongate substantially flat wiper-contact area in a first plane that is radial with respect to said axis, a second plate of insulating material carried by said mount and having an elongate substantially flat surface in a second plane that is radial with respect to said axis and in spaced confronting relation to said conductive plate, a float arm pivotally supported with a measure of axial-displacement accommodation at said journal-bearing formation and carrying a single compliant conductive wiper member within the space between said plates, said wiper member having separate wiper arms extending in oppositely diverging directions and in resiliently loaded wiping contact with both said plates, said insulating plate including a resistance element exposed to wiper contact, and an electrical connection from one end of said resistance element to the second of said bolts.

4,441,365

SIGHT-GLASS MOUNTING

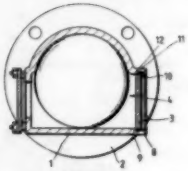
Wilhelm Schulz, and Josef Kirchkamp, both of Krefeld, Fed. Rep. of Germany, assignors to Schulz & Co. KG, Krefeld, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 350,038

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115833

Int. Cl.³ G01F *23/02*

U.S. Cl. 73—331 **9 Claims**



1. A sight-glass mounting comprising a section of pipe in which openings provided on diametrically opposite sides are sealingly covered by glass discs in which the openings covered over by the glass discs are arranged offset so far off-centre with respect to the axis of the section of pipe that a bulge necessary for the accommodation of the glass discs exists at only one side of the section of pipe.

4,441,366

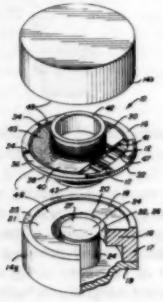
FLEXURE WITH ELECTRICAL CONDUCTOR

Richard A. Hanson, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 14, 1981, Ser. No. 283,341

Int. Cl.³ G01P *15/13*

U.S. Cl. 73—517 B **33 Claims**



1. In a force sensing transducer having a force sensing element and a mounting base, a flexure structure connecting the force sensing element to the mounting base, comprising:

a thin portion with oppositely facing surfaces for carrying electrical conductors, the strength of the thin portion being insufficient to afford the desired spring rate and support for said force sensing element;

a thick rib extending continuously between the force sensing element and the mounting base, the composite structure of said thin portion and rib providing sufficient strength to afford the desired spring rate and support for said force sensing element and having a neutral bending plane substantially equidistant from the surfaces of said thin portion; and

conductive layers on the faces of said thin portion interconnecting electrical circuit components on said force sensing element with circuits remote therefrom.

4,441,367

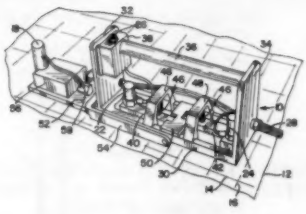
APPARATUS FOR DETERMINING FABRIC TENSION

John W. Daws; Hugh W. Bradley, Jr., and Sheldon A. Canfield, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 3, 1981, Ser. No. 299,234

Int. Cl.³ G01H *5/00*; G01L *5/10*

U.S. Cl. 73—597 **13 Claims**



12. An apparatus for measuring the propagation velocity of an acceleration wave in a stretched woven fabric comprising:

(a) a hand carryable articulated frame for being seated upon and contacting said fabric;

(b) a first means carried by a first pivotable arm of the frame for contacting said fabric and sensing at least the leading front of said wave and having a first output responsive thereto;

(c) a second means carried by a second pivotable arm of the frame for contacting said fabric and sensing at least the leading front of said wave and having a second output responsive thereto, said first means and second means separated by a distance S and said first pivotable arm and said second pivotable arm having a common axis of rotation; and

(d) a timing means coupled to said first and second outputs for measuring the time T it takes said wave to travel from said first sensing means to said second sensing means,

whereby the propagation velocity V of said acceleration wave can be computed from the equation V=S/T.

4,441,368

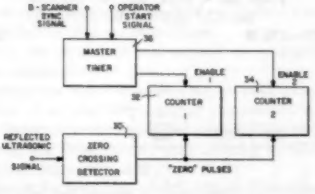
METHOD AND MEANS FOR DETERMINING ULTRASONIC WAVE ATTENUATION IN TISSUE

Stephen W. Flax, Waukesha, Wis., assignor to General Electric Company, Rancho Cordova, Calif.

Filed Apr. 19, 1982, Ser. No. 369,423

Int. Cl.³ A61B *10/00*

U.S. Cl. 73—599 **9 Claims**



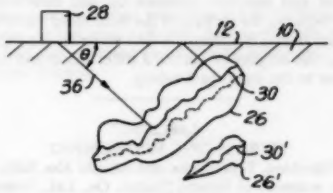
1. A method of determining the second moment frequency domain characteristics of a reflected ultrasonic wave passed through tissue by time domain analysis comprising the steps of detecting zero crossings of said wave, and comparing the detected zero crossings during one interval of time corresponding to a first tissue depth with the detected zero crossings during a second period of time corresponding to a second tissue depth thereby determining the change in the second moment frequency domain characteristics of said wave between the two depths.

4,441,369

ULTRASONIC DETECTION OF EXTENDED FLAWS

Dennis E. Lessard, Waterford, and Paul F. Sabourin, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,710
Int. Cl.³ G01N 29/04
U.S. Cl. 73—602 15 Claims



1. A method for defining an extended flaw in a body, comprising:

propagating a beam of pulses of vibratory energy from a plurality of points on a surface of said body at a predetermined angle into said body, said vibratory energy being of a type which may be reflected at said extended flaw;

detecting reflected vibratory energy at said plurality of points;

determining that a plurality of peaks of said reflected vibratory energy occur within a predetermined time at each of a plurality of adjacent ones of said plurality of points;

correlating said plurality of peaks at at least three adjacent ones of said plurality of points;

defining as a search point for said one of said peaks the one of said plurality of points at which a maximum amplitude of one of said peaks exists;

logging said search point and a range to a facet producing said maximum amplitude;

continuing the steps of defining and logging for a substantial number of others of said peaks; and

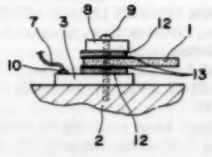
calculating locations of facets within said body producing said maximum amplitudes of said one and said substantial number of others of said peaks based on said predetermined angle, said search points and measured ranges from each of said search points.

4,441,370

VIBRATION SENSOR

Okinobu Sakurada, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka and Toyota Jidosha-Kogyo Kabushiki Kaisha, Aichi, both of, Japan

Filed Jan. 29, 1982, Ser. No. 344,226
Claims priority, application Japan, Jan. 30, 1981, 56-12947[U]
Int. Cl.³ G01L 23/22; G01H 1/08
U.S. Cl. 73—651 7 Claims



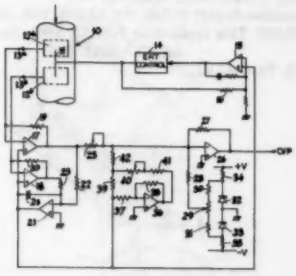
1. A vibration sensor which comprises a support plate, a generally elongated bivrator element mounted on and extending from the support plate in a cantilever fashion, and at least one plate-like metallic piece interposed between the vibrator element and the support plate and rigidly secured to that end portion of the vibrator where said vibrator is mounted on the support plate said plate-like metallic piece being secured to the vibrator element by soldering or a bonding agent.

4,441,371

GAS FLOW METERS

Charles P. Cockshott, Balsall Common, and Kenneth S. Evans, Blackpool, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 15, 1982, Ser. No. 358,109
Claims priority, application United Kingdom, Apr. 4, 1981, 8110611
Int. Cl.³ G01F 1/64
U.S. Cl. 73—861.09 4 Claims



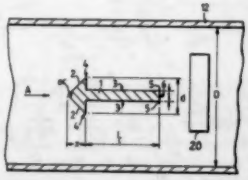
1. A corona-discharge type gas flow meter having a discharge electrode, a split collecting electrode, means for maintaining a substantially constant impedance discharge between the discharge electrode and the collecting electrodes and a current difference circuit comprising amplifier means having inputs connected to the collecting electrodes and producing at a first output point a first output signal dependent on the current difference and also a second output signal at a second output point dependent on the sum of the currents derived from the terminals of the collecting electrodes, an output amplifier connected to said amplifier means to receive said first output signal, adjustable means for applying to said output amplifier a fixed offset nulling signal, and means sensitive to said second output signal for applying to said output amplifier a variable offset nulling signal.

4,441,372

VORTEX FLOWMETER

Richard H. Barnard, St. Albans, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 5, 1982, Ser. No. 375,350
Claims priority, application United Kingdom, May 14, 1981, 8114740; Feb. 23, 1982, 8205243
Int. Cl.³ G01F 1/32
U.S. Cl. 73—861.22 7 Claims



1. Velocity measurement apparatus comprising: a passageway; an elongate vortex shedding bluff body extending across said passageway, said passageway being adapted to carry a flow of a fluid; and a sensor downstream of said bluff body to

sense vortices produced by said bluff body, said sensor producing an output signal directly proportional to the speed of said fluid relative to said bluff body, said bluff body having a cross-sectional shape including a tapered head with the taper pointing away from said sensor and a tail portion downstream of said head and having a width along the entire length thereof, said tail portion width being smaller than the width of said head, said head having an axial length not greater than half of said head width.

4,441,373

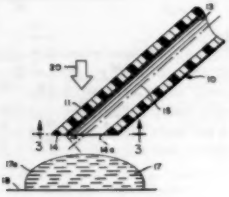
COLLECTION TUBE FOR DRAWING SAMPLES OF BIOLOGICAL FLUIDS

Fred K. White, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation-in-part of Ser. No. 13,244, Feb. 21, 1979, Pat. No. 4,250,893. This application Feb. 13, 1981, Ser. No. 234,869

Int. Cl.³ B01L *2/03*

U.S. Cl. 73—864.02 **16 Claims**



1. A collecting tube for drawing samples of blood and other biological fluids, comprising an open-ended tube formed of rigid transparent material and having a cylindrical bore, said tube having a beveled tip formed by a planar end surface having an oval opening defining the entrance to said bore, said end surface being sloped so that a line extending therealong and defining the long axis of said oval intersects a plane normal to the longitudinal axis of said bore at an acute angle within the range of about 35° to 60°, whereby, said oval opening promotes the spontaneous entry of a fluid sample into the bore when brought into contact therewith.

4,441,374

DEVICE FOR DILUTING LIQUID SAMPLE

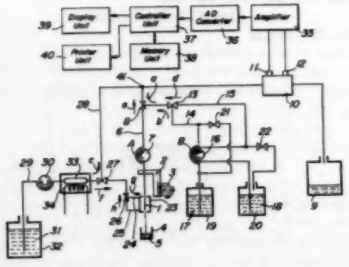
Nobuyoshi Suzuki, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Japan

Continuation of Ser. No. 195,062, Oct. 7, 1980, abandoned. This application Oct. 6, 1982, Ser. No. 433,036

Claims priority, application Japan, Oct. 17, 1979, 54-132796

Int. Cl.³ G01N *35/00*

U.S. Cl. 73—864.12 **5 Claims**



1. A device for diluting liquid sample comprising a first roller pump to suck and feed a liquid sample, a second roller pump to suck and feed a diluent solution, a liquid path tubing including a branch connected to outputs of said first and second roller pumps to feed the liquid sample and diluent solution thus sucked and fed to a predetermined position, and means to regulate a ratio of revolving speeds of said first and second roller pumps to control a rate of dilution of said liquid sample by said diluent solution, the improvement comprising a third roller pump having inputs connected to a plurality of standard solutions and outputs selectively connectable to said liquid path tubing, whereby a ratio of revolving speeds of said second and third roller pumps is changed to control a rate of dilution of one of said standard solutions by said diluent solution, wherein between the outputs of the third roller pump and said liquid path tubing is arranged a first valve having inputs connected to the outputs of the third roller pump and an output connected to the liquid path tubing.

4,441,375

GYROSCOPIC INSTRUMENT

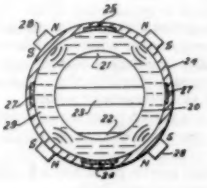
Kiyomi Minohara, Takarazuka, and Atsushi Abe, Suita, both of Japan, assignors to Furuno Electric Co., Ltd., Nishinomiya, Japan

Filed Jan. 14, 1981, Ser. No. 225,152

Claims priority, application Japan, Jan. 23, 1980, 55-7110; Feb. 8, 1980, 55-14932; Jul. 7, 1980, 55-92998; Jul. 24, 1980, 55-102193

Int. Cl.³ G01C *19/20, 19/24*

U.S. Cl. 74—5.46 **26 Claims**



1. A gyroscopic instrument, comprising:

a. a magnetic fluid,

b. an outer container encompassing said magnetic fluid,

c. an inner container enclosing at least one high speed rotating gyro rotor, being supplied with electric power from the outer container side and being positioned within said container, and

d. magnetic flux producing means adjustably mounted on the outer container so that magnetic fluxes produced thereby reach said magnetic fluid to support said inner container free of contact with said outer container, said magnetic flux producing means comprising a pair of magnets which are oriented adjacent to one another with the north pole of one magnet facing the south pole of an adjacent magnet.

4,441,376

MOTOR DRIVEN HINGE ASSEMBLY

William H. Tobey, Littleton, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Apr. 30, 1982, Ser. No. 373,575

Int. Cl.³ F16H *29/20, 21/44*; E05D *7/04, 7/06*

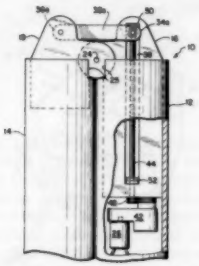
U.S. Cl. 74—89.15 **6 Claims**

1. A motor driven hinge assembly for effecting pivotal motion of a second hollow tubular member relative to a first hollow tubular member comprising:

(a) said first member having an interior and said second member having an interior, said first and second members having first and second brackets, respectively, connected thereto near the top ends of said first and second members and said first and second members being hingedly connected with a hinge pin extending through said first and said second brackets, said hinge pin being positioned

whereby when said first and said second members are in a folded position, sides of said first and second members being disposed closely adjacent each other with said first and second members being disposed in parallel relationship, and when in an unfolded position said ends thereof abut end-to-end, said first and said second members including recesses near said ends thereof below the hinge pin to accommodate portions of the first and second brackets;

(b) linking means always extending above the hinge pin and having a first end slidingly connected with said first bracket and a second end pivotally connected with said second bracket;



(c) a motor disposed within said interior of said first member; and

(d) coupling means between said motor and said first end of said linking means for effecting motion of said linking means into or out of said interior of said first member through the top end of the first member through the top end of the first member thereby effecting pivotal motion of said second member relative to said first member between said folded and said unfolded positions, said linking means, said coupling means and said first and said second brackets except for the portions thereof adjacent said hinge pin being configured and positioned for being contained entirely within said interior of said first and of said second members when in an unfolded position.

4,441,377

LINKAGE FOR ACTUATING A CARTON ERECTING APPARATUS

Ulrich G. Nowacki, Leisure City, Fla., assignor to International Paper Company, New York, N.Y.

Division of Ser. No. 100,402, Dec. 5, 1979, Pat. No. 4,331,435. This application Jan. 18, 1982, Ser. No. 339,999

Int. Cl.³ F16H *21/44*

U.S. Cl. 74—105 **2 Claims**

1. An apparatus for synchronizing the rotation of two separate elements in opposite directions in a plane about a point between them, comprising:

a double-acting air-operated cylinder having a piston traveling along a line of movement;

a guide bar, adapted to move with the piston of the cylinder;

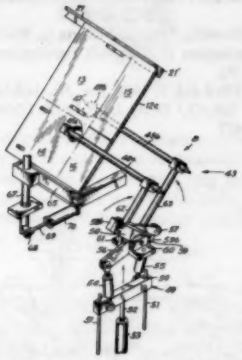
a pair of first link rods, one end of each first link rod being rotatably connected to the guide bar and the other end of each first link rod extending away from the cylinder;

a pair of second link rods, one end of each second link rod being rotatably connected to the other end of a respective one of the first link rods and the other end of each second link rod extending away from the cylinder; and

a pair of blocks, each block being rigidly connected to the other end of the second link rod extending away from the cylinder, one end of each block having a pivotal connection to the other block along a common fixed line of rotation, perpendicular to the line of movement of the piston of the cylinder; the other end of each block being free to rotate about the pivotal connection of the blocks in opposite directions; the free end of each block being connected to one of the two elements; and the other ends of the second link rods converging towards the pivotal connection of the blocks;

the guide bar, the link rods and the blocks moving in a plane, parallel to the plane in which the two elements rotate about the point;

the free ends of the blocks rotating apart, about the pivotal connection of the blocks, from a first position to a second



position; the free ends of the blocks being about 90° further apart in their second position than in their first position; and the two elements rotating 90° towards each other with rotation of the free ends of the blocks from their first position to their second position; and

the free ends of the blocks being 90° apart in their first position and 180° apart in their second position; and the two elements rotating towards each other to a position 0° apart when the blocks rotate to their second position.

4,441,378

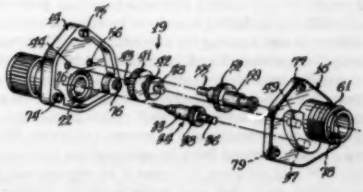
GEARBOX DRIVE FOR A SPEEDOMETER

George M. Ponczek, Chicago, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Jan. 26, 1981, Ser. No. 228,329

Int. Cl.³ F16H *1/06, 1/20*

U.S. Cl. 74—414 **16 Claims**



1. A gearbox for obtaining the proper drive ratio between an element in the drive train of a vehicle and a speedometer or odometer, comprising; housing means, an input gear mounted for rotation in the housing means, intermediate gear means engaging the input gear and the output gear to rotate the output gear in the same direction and at a predetermined drive ratio with respect to the input gear, said input gear and output gear being positioned with respect to each other to react in generally opposite directions on the intermediate gear means upon rotation of the input gear in one direction, and means for substantially balancing the radial forces acting on the intermediate gear means by the input gear and the output gear in both

directions of rotation of the input gear including said housing means being constructed to reverse the positions of the input and output gears relative to the intermediate gear means upon rotation of the input gear in the other direction so that the input gear and the output gear react in generally opposite directions against the intermediate gear means in either direction of rotation of the input gear.

4,441,379

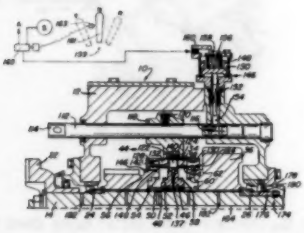
INTERLOCK DEVICE FOR A TRANSMISSION SHIFT MECHANISM

Joseph L. Malkowski, Troy, and Calvin G. Wells, Warren, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 3, 1980, Ser. No. 165,612

Int. Cl.³ G05G *5/10*; B60K *17/34*

U.S. Cl. 74—477 **5 Claims**



1. An interlock device for a shift mechanism of multi-speed power transmission device which receives an input from a torque transmitting power source which power source can be selectively operated in a power mode or a neutral mode, said multi-speed power transmission device being capable of operation in specific gear ratio operating conditions or a neutral non-operating condition, said interlock device comprising:

said shift rod being mounted within a housing of said multi-speed power transmission device and capable of selective axial positioning therein at a plurality of predetermined locations each of which is associated with one of said specific gear ratio operating conditions and said neutral non-operating condition;

means for preventing said selective axial positioning of said shift rod from one of said predetermined locations to another of said predetermined locations when said torque power transmitting source is being operated in said power mode;

said means for preventing said selective axial positioning of said shift rod including a position locating device mounted relative to said housing for movement radially toward and away from said shift rod, said shift rod having a plurality of axially separated detents along the exterior surface thereof which are respectively aligned with said position locating device when said shift rod is positioned at said plurality of predetermined locations, and means for applying a predetermined force to said position locating device towards said shift rod to cause it to engage said detents associated with said one predetermined location when said torque transmitting power source is being operated in said power mode to prevent axial movement of said shift rod to said another predetermined location; and

said means for applying said predetermined force including a power cylinder mounted relative to said housing with a piston and a piston rod thereof being aligned with said position locating device to be capable of transmitting said predetermined force thereto and means for applying fluid pressure to said piston to generate said predetermined force when said torque transmitting power source is being operated in said power mode and for relieving said fluid pressure from said power cylinder when said torque transmitting power source is being operated in said neutral mode.

4,441,380

FOOT-OPERATED CONTROL DEVICE FOR PARKING BRAKE

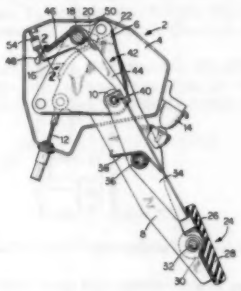
Hiroshi Kawaguchi, Mishima, and Shuho Nishina, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 10, 1982, Ser. No. 440,600

Claims priority, application Japan, Nov. 11, 1981, 56-167925[U]; Nov. 19, 1981, 56-172437[U]; Nov. 19, 1981, 56-172438[U]

Int. Cl.³ G05G *1/14*

U.S. Cl. 74—512 **14 Claims**



1. A foot-operated device for controlling a parking brake of a vehicle, comprising:

a bracket;

a parking brake pedal connected to said bracket pivotally about a first axis and having at one end thereof ratchet teeth formed along an arc of a circle a center thereof being located at said first axis;

a pedal pad connected to the other end of said parking brake pedal pivotally about a second axis parallel to said first axis, said pedal pad being pivoted between its original position and operated position;

a pawl member connected to and spaced from said bracket pivotally about a third axis parallel to said first axis, said pawl member including a pawl engageable with said ratchet teeth;

a lever connected to said bracket pivotally in proximity of said pawl member about a fourth axis aparllel to said first axis;

connecting means for linking said pedal pad to said lever to transmit a pivotal movement of the former to the latter such that a movement of said pedal pad incident to a pivotal movement of said parking brake pedal is not transferred to said lever; and

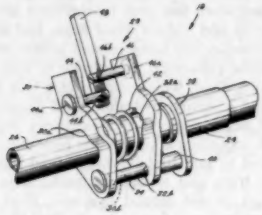
spring means, associated with said pawl member and said lever, for biasing said pawl member in a first direction that causes said pawl to engage said ratchet teeth while said pedal is placed in said original position, and biasing said pawl member in a second direction that causes said pawl to disengage from said ratchet teeth while said pedal pad is placed in said operated position, the direction of biasing said pawl member by said spring means being changed from said first direction to said second direction by a pivotal movement of said lever resulting from the pivotal movement of said pedal pad from said original position to said operated position, a biasing force of said spring means in said second direction being smaller than an engagement force existing between said pawl member and said ratchet teeth in engagement with said pawl member.

4,441,381

LOCKING AND POSITIONING APPARATUS FOR RECLINING SEATS

Charles A. Haugk, Fort Wayne, Ind., assignor to General Engineering & Manufacturing Corp., Andrews, Ind.

Filed Sep. 30, 1982, Ser. No. 431,391
Int. Cl.³ G05G 5/06; B60N 1/02
U.S. Cl. 74—531 **4 Claims**



1. In a locking and positioning apparatus, comprising:
a. first and second tubular telescoping members adapted for longitudinal movement relative to one another;
b. gripping means operatively mounted on said first tubular member and rockable to a first position in frictional gripping engagement with said second tubular member for militating against relative longitudinal movement between said first and said second tubular members and to a second position for allowing relative longitudinal movement between said first and said second tubular members, said gripping means including a pair of gripping members adapted to be rocked away from each other for frictionally gripping said second tubular member in the first position, each said gripping member comprising a washer having a portion engageable with said second tubular member;
c. means operatively associated with said pair of gripping members for rocking said pair of members into the first position, said means comprising a spring surrounding said second tubular member and operatively disposed between said washers whereby the portions of said washers grip said second tubular member in the first position; and
d. lever means operatively associated with said pair of gripping members for rocking said pair of gripping members from the first position to the second position for releasing said second tubular member from said first tubular member, said lever means comprising a lever having an end disposed between said washers and a pair of cooperating pins, one of said pins being operatively associated with one of said washers and pivotally connected to the end of said lever and the other said pins being operatively associated with the other said washer and pivotally connected to the end of said lever in a longitudinally spaced relation to the first mention pivotal connection whereby said second tubular member may be positioned and retained in various extended telescope positions relative to said first tubular member.

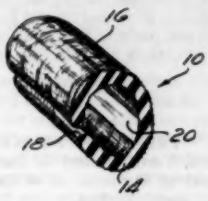
4,441,382

STEERING WHEEL COVER

Laura K. Snooks, San Clemente, Calif., assignor to Alex S. Reinharcz Enterprises, Inc., San Clemente, Calif.

Filed Jul. 28, 1982, Ser. No. 402,755
Int. Cl.³ B62D 1/06
U.S. Cl. 74—558 **5 Claims**

1. An improved steering wheel cover comprising:
a tubular elastromeric member sized to extend about the circumference of a steering wheel, said member formed having a substantially cylindrical cross-sectional configuration sized to tightly conform to the configuration of said steering wheel;
a circumferentially extending slot formed on the interior surface of said tubular elastromeric member adapted to permit said tubular elastromeric member to extend about and generally encircle the circumference of said steering wheel; and



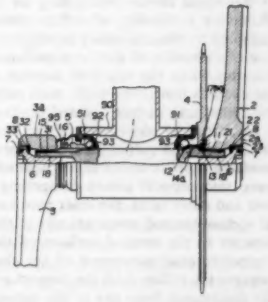
a fabric covering disposed in a contiguous orientation to the exterior surface of said tubular elastromeric member, said tubular elastromeric member and said fabric covering being integrally molded together to form a continuous uninterrupted wheel cover member which is self-maintained upon said steering wheel.

4,441,383

GEAR CRANK FOR A BICYCLE

Takashi Segawa, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Division of Ser. No. 47,563, Jun. 11, 1979, Pat. No. 4,300,411.
This application Aug. 19, 1981, Ser. No. 294,412
Claims priority, application Japan, Jun. 12, 1978, 53-80968; Jun. 12, 1978, 53-80969
Int. Cl.³ G05G 1/14
U.S. Cl. 74—594.2 **1 Claim**



1. A gear crank for a bicycle, comprising a crank shaft having a first and a second end portion; a pair of crank arms respectively connected to the first and second end portion of said crank shaft; at least one chain gear mounted to said first end portion of said crank shaft, said crank shaft having at said first end portion a larger diameter portion separate from said first end portion and extending radially outward of said first end portion and a stepped portion having a retaining face directed axially outward of said first end portion, said larger diameter portion being positioned axially outward of said stepped portion and being spline connected with said first end portion, said chain gear having at its center an insertion bore fit onto said first end portion of said crank shaft and, around said insertion bore, a contact face contacting with said retaining face; a number of axially extending splines provided at the outer periphery of said larger diameter portion and projections respectively engageable with said splines provided at said chain gear at a position axially outward with respect to said insertion bore for restraining said chain gear from rotation

with respect to said crank shaft; and a first and second connecting means respectively provided between said crank arms and said first and second end portions of said crank shaft for connecting said crank arms to said first and second end portions, said first connecting means connecting one of said crank arms to said first end portion and biassing said one crank arm toward said retaining face to allow said contact face at said chain gear to contact with said retaining face, said chain gear being fixed rotatably and non-axially movably with respect to said crank shaft.

4,441,384

FREEWHEEL DEVICES

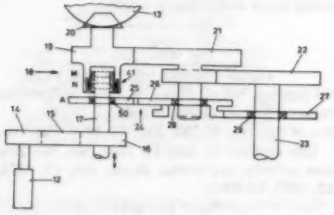
Kenneth Watson, Yeovil; Richard G. Buswell, and James E. Saunders, both of Sherborne, all of England, assignors to Westland plc, Yeovil, England

Filed Jul. 1, 1980, Ser. No. 164,905

Claims priority, application United Kingdom, Jul. 26, 1979, 7926018

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—665 GA **6 Claims**



1. A transmission system for a multi-engined helicopter includes a freewheel device comprising an axially movable input shaft having a plurality of rollers retained around the shaft and adapted to transmit rotary motion from the shaft to a selected one of a plurality of axially spaced-apart output gears and to over-run when the speed of rotation of the selected output gear exceeds that of the shaft, each output gear having an internal cylindrical surface located concentrically of the shaft axis so that axial movement of the shaft engages the rollers with the selected output gear, said freewheel including a freely rotatable support means axially spaced-apart from the output gears, said support means comprising a ball bearing having inner and outer races, the inner race having an internal cylindrical surface located concentrically of the shaft and of a similar diameter to the internal surfaces of the output gears, whereby selective axial movement of the shaft to a neutral position engages the rollers with the support means so as to be rotationally disengaged from any of the output gears and isolated from independent rotary motion of any one of said output gears.

4,441,385

TRANSMISSION CONTROL SYSTEM WITH POSITIVE LOCKUP CLUTCH DISENGAGING SYSTEM

Yutaka Taga; Kazuaki Watanabe, and Shinya Nakamura, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 10, 1981, Ser. No. 282,189

Claims priority, application Japan, Jul. 17, 1980, 55-97986

Int. Cl.³ B60K *41/16*

U.S. Cl. 74—867 **2 Claims**

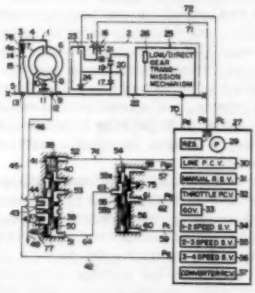
1. In an automatic transmission comprising:

(a) a gear transmission mechanism, which can provide a plurality of forward speed stages including a highest speed stage and a next to highest speed stage, and which comprises a plurality of hydraulic fluid pressure activated friction engaging mechanisms combinations of which are selectively actuated by selective supply of hydraulic fluid pressures thereto so as to engage said plurality of speed stages, said plurality of hydraulic fluid pressure activated friction engaging mechanisms including a first hydraulic fluid pressure thereto when and only when said gear transmission mechanism is providing its said highest speed stage and a second friction engaging mechanism which is engaged by supply of a second hydraulic fluid pressure thereto when said gear transmission mechanism is providing its said next to highest speed stage but which is not engaged when said gear transmission mechanism is providing its said highest speed stage, said second hydraulic fluid pressure not being present at that time;

(b) a torque converter, the interior of which is filled with hydraulic fluid, which comprises a lock up clutch and a first and a second hydraulic fluid channel, said lock up clutch being respectively selectively engaged or disengaged, according as to whether hydraulic fluid pressure is supplied to said first hydraulic fluid channel and is released from said second hydraulic fluid channel, or is supplied to said second hydraulic fluid channel and is released from said first hydraulic fluid channel: a transmission control system, comprising:

(c) a source of regulated torque converter hydraulic fluid pressure for filling the inside of said torque converter with hydraulic fluid;

(d) a hydraulic fluid pressure control system which controls said gear transmission mechanism by said selective supply



of said combinations of said hydraulic fluid pressures including said first hydraulic fluid pressure and said second hydraulic fluid pressure thereto so as to selectively to engage various ones of said plurality of speed stages, said first hydraulic fluid pressure and said second hydraulic fluid pressure being alternatively selected to be supplied, comprising a governor hydraulic fluid pressure control valve which produces a governor hydraulic fluid pressure which is representative of vehicle speed and which increases with increasing vehicle speed;

(e) a lock up clutch control valve which has a first switched position and a second switched position, which when in its said first switched position switches said first hydraulic fluid channel so as to supply thereto a supply of said torque converter hydraulic fluid pressure and switches said second hydraulic fluid channel so as to release hydraulic fluid therefrom, and which when in its said second switched position switches said second hydraulic fluid channel so as to supply thereto a supply of said torque converter hydraulic fluid pressure and switches said first hydraulic fluid channel so as to release hydraulic fluid therefrom; said lock up clutch control valve being switched to its said first switched position by supply of a control hydraulic fluid pressure thereto, and being otherwise switched to its said second switched position; and

(f) a lock up clutch interrupt valve which comprises a valve element shiftable between a first switched position and a second switched position, and a spring for biasing said

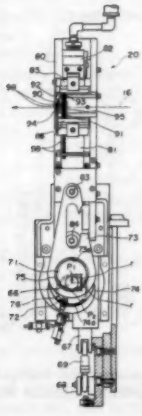
valve element toward its said second switched position, which when said valve element is in its first switched position switches a supply of said first hydraulic fluid pressure so as to supply said first hydraulic fluid pressure to said lock up clutch control valve as said control hydraulic fluid pressure, and which when said valve element is in its said second switched position does not switch said supply of said first hydraulic fluid pressure so as to supply said first hydraulic fluid pressure to said lock up clutch control valve as said control hydraulic fluid pressure, so that said lock up clutch control valve in this case is not supplied with any such control hydraulic fluid pressure; said lock up clutch interrupt valve being supplied with said second hydraulic fluid pressure, when it is present, and said governor hydraulic fluid pressure by said hydraulic fluid pressure control system; said second hydraulic fluid pressure and said governor hydraulic fluid pressure being applied in opposite directions against said valve element of said lock up clutch interrupt valve, and, when said lock up clutch interrupt valve is not supplied with said second hydraulic fluid pressure, said valve element of said lock up clutch interrupt valve being switched between its said first switched position and its said second switched position by the balance of said governor hydraulic fluid pressure and the spring force of said spring so as to be switched to its said second switched position when the pressure value of said governor hydraulic fluid pressure is less than a critical pressure value, and being switched to its said first switched position when the pressure value of said governor hydraulic fluid pressure is greater than said critical pressure value, and when said lock up clutch interrupt valve is supplied with said second hydraulic fluid pressure, said valve element of said lock up clutch interrupt valve being switched to said second switched position irrespective of the value of said governor hydraulic fluid pressure.

4,441,386

WIRE CUTTER AND STRIPPER APPARATUS

Akinori Hara, Akishima, Japan, assignor to Osawa Press Mfg., Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1981, Ser. No. 226,075
Claims priority, application Japan, Oct. 28, 1980, 55-151072
Int. Cl.³ H02G *1/12*
U.S. Cl. 81—9.51 **3 Claims**



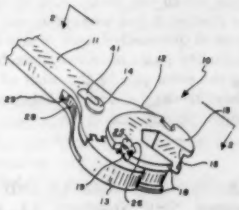
1. A wire cutter and stripper apparatus which comprises:
a frame;
a wire feed means on said frame for advancing an insulated wire by a predetermined length;
a cutter and stripper mechanism including (1) a crank means having a crank shaft rotatably mounted on said frame and a pair of identical crank arms in the form of discs fixedly mounted on said crank shaft in eccentric relation so that the centers of said discs are offset from the axis of said crank shaft by an equal distance, said eccentric discs being disposed in diametrically opposed relation, (2) a pair of elongated connecting members each having a circular aperture formed therethrough at one end thereof, said pair of eccentric discs being rotatably received in said circular apertures of said connecting members, (3) a pair of slide members having first and second ends and being mounted on said frame for movement along axes thereof, said first ends of said slide members being pivotally connected to the other ends of said connecting members, respectively, (4) a pair of opposed cutter and stripper holders mounted respectively on said second ends of said slide members, said cutter and stripper holders holding respective cutter blades and stripper blades, and (5) an actuator means operable to move said crank shaft through a predetermined angle and thereby to move said cutter and stripper holders towards each other with a nonuniform motion which has a low speed at the beginning and end thereof and a higher speed in the middle thereof so that said cutter blades and said stripper blades cut the wire and the insulation, respectively, to the same depth regardless of backlash and play in said apparatus.

4,441,387

OPEN END RATCHET WRENCH

Bacel G. Hendricks, 1190 E. Beecher, Brigham City, Utah 84302

Filed Jun. 11, 1982, Ser. No. 387,543
Int. Cl.³ B25B *13/46, 13/00*
U.S. Cl. 81—61 **8 Claims**



1. An open ended ratchet wrench comprising:
an elongate handle member;
a jaw member fixed to the handle and having a concave arcuate side with ratchet teeth extending toward its geometric center;
a retractable jaw member having a concave arcuate side with ratchet teeth generally extending toward the ratchet teeth of the fixed jaw member;
a circular wrenching disc having an open ended nut receiving recess and being adapted to be retained by the jaw members between the arcuate faces thereof;
at least two spaced apart pawl members each mounted within one of at least two recesses within the wrenching disc;
spring means urging each pawl member into engagement with the ratchet teeth;
releasable means connecting the retractable jaw to the handle in a disc retaining relationship with the fixed jaw, said releasable means comprising pivot pin means and bore means, said bore means being carried by the handle and, the pivot pin means being disposed rotatably in said bore means;
the pivot pin means has a longitudinal axis and further comprises cam means eccentric to the longitudinal axis; and
the movable jaw further comprises bore means accepting the

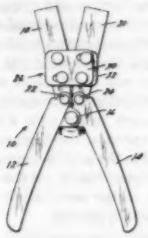
cam portion of the pivot pin means therewithin, so that rotation of the pivot pin means causes the cam means to act against the bore means of the jaw to move the jaw out of the disc retaining relationship.

4,441,388

HAND TOOL LINKAGE

Henry A. Manor, Detroit, Mich., assignor to Balmar Crimp Tool Corp., Orlando, Fla.

Filed Oct. 28, 1981, Ser. No. 316,046
Int. Cl.³ B25B 7/06
U.S. Cl. 81—300 **13 Claims**



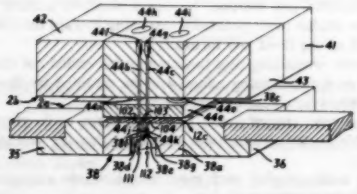
4. In an apparatus having a pair of levers pivotally interconnected by at least a pair of cross link members, each of said cross link members being pivotally attached to said levers by pivot pins, the improvement wherein each of said cross link members is pivotally attached to both of said levers by separate pivot pins, each of said pivot pins of each cross link member extending through both of said cross link members and being attached to only one of said levers, said cross link members being movable relative to one another as said levers are pivoted with respect to one another, each of said cross link members further including guide means separate from said levers for reinforcing the pivot pins of the other of said cross link members, thereby tending to counter-balance the forces exerted on said pivot pins by said levers.

4,441,389

CHAIN SEVERING APPARATUS AND METHOD

George W. Graham, North Kingstown, R.I., and Richard P. McCally, Mansfield, Mass., assignors to Avon Products Inc., New York, N.Y.

Filed Aug. 4, 1981, Ser. No. 290,064
Int. Cl.³ B26D 7/06
U.S. Cl. 83—140 **10 Claims**



1. Apparatus for severing a length of chain, said chain comprising a succession of interior annular links between first and second end links, each interior link passing from one side of the immediately preceding link to the other side of the immediately preceding link and having a first link portion passing through the central opening defined by that immediately preceding link and each interior linking passing from one side of the immediately succeeding link to the other side of the immediately succeeding link and having a second link portion passing through the central opening defined by that immediately succeeding link, said apparatus comprising:

means for supporting said chain, said support means including: a first member for supporting a section of said chain including said interior links; a pin depending outwardly from said first member and adapted to seat in the recess between first and second link portions, respectively, of succeeding and preceding interior links passing through the same central opening of an interior link of said chain section; and said first member having first and second bores disposed at preselected first and second distances, respectively, relative to said pin, said first and second distances being such that with said pin seated in said recess said first bore aligns with a first link portion of an interior link and said second bore aligns with a second link portion of an interior link;

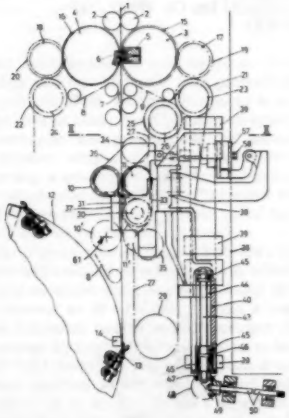
and means for severing the link portion aligned with said first bore and the link portion aligned with sad second bore, said severing means including: a second member for moving relative to said first member between first and second positions; means affixed to said second member for engaging said chain section as said second member moves from said first to second positions; and first and second severing members carried by said second member and positioned to sever the link portion aligned with said first bore and the link portion aligned with said second bore, respectively, as said second member moves from said first to said second positions.

4,441,390

SHEET SEPARATING AND TRANSPORT APPARATUS

Hatto Hechler; Godber Petersen, both of Augsburg, and Alfons Frick, Königsbrunn, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,392
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1981, 3139117
Int. Cl.³ B65H 35/06
U.S. Cl. 83—154 **12 Claims**



1. Sheet severing, separating and transport apparatus, particularly for use with a printing machine having

a frame (**28**);

feed roller means (**2**) for feeding a web of a substrate (**1**);

a pair of cutter cylinders (**3, 4**) cutting the web of substrate being fed thereto by said feed roller means into individual sheets (**7**);

a gripper cylinder (**12, 13, 14**) for receiving the cut sheets,

and operating at the circumferential speed higher than the speed of the feeding roller means (2);
a first and a second separating roller (10,11; 10*a*,11*a*);
belt transport means (8,9; 8*a*, 9*a*) to receive the cut sheets from said cutter cylinders and to deliver them to the gripper cylinder;
and means synchronizing operation of the cutter cylinders, the separating rollers and the belt transport means for timed delivery of cut sheets to said gripper cylinder, and adjustable for different lengths of the cut sheets
comprising, in accordance with the invention
a first carrier structure (38) longitudinally-with respect to the direction of transport of the sheets by said belt transport means (8, 9)-moveably mounted in the frame (28);
the first separating roller (10, 10*a*) being secured to the carrier for longitudinal movement therewith;
a second carrier structure (52, 53);
the second separating roller (11) being secured to said second carrier structure;
a shaft (32) rotatably secured in the second carrier structure and having an axis of rotation parallel to the first separating roller (10);
positioning means (55) adjustably securing the second carrier structure (52, 53) to the first carrier structure to adjust the spacing between the first and second separating rollers;
a gear belt (33) drivingly connecting the first and second separating rollers;
the belt transport means including
a first endless transport belt means (8,8*a*) being passed with one run adjacent the circumference of the first separating roller (10) and at one side of the substrate and then the cut sheet (1, 7), and
a second endless transport belt means (9, 9*a*) being passed with one run adjacent the circumference of the second separating roller (11) and at the other side of the substrate;
and positive drive means (27) positively driving one (10) of the separating rollers from the cutter cylinders (3, 4) with the same circumferential speed as the cutter cylinders; and
belt drive means for driving the endless belt means (8, 8*a*, 9, 9*a*) at essentially the same linear speed as the cutter cylinders,
so that the sheets (7) cut by the cutter cylinders (3, 4) from the web of substrate (1) will be transported to the separating rollers (10, 10*a*, 11, 11*a*) and gripped with the leading edge of the sheet by the separating rollers upon arival thereat, and accelerated to the speed of the cutter cylinders and hence of the gripper cylinder (12, 13, 14) while being maintained in stretched, taut, condition by the endless belt means,
longitudinal movement of the first carrier structure (38) carrying said separating rollers (10, 11, 10*a*, 11*a*) along the length of the paths of the belt transport means permitting adjustment of the apparatus to accommodate sheets (7) of various lengths.

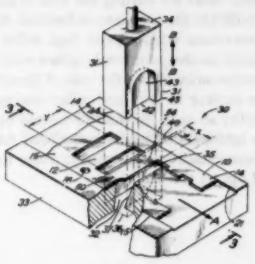
4,441,391

APPARATUS FOR SEVERING AN ARTICLE FROM A CARRIER AND FOR POSITIONING THE SEVERED ARTICLE

Gary G. Seaman, Broomfield, Colo., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Apr. 27, 1983, Ser. No. 488,899
Int. Cl.³ B65H *35/06*
U.S. Cl. 83—165 **2 Claims**

1. Apparatus for severing and then positioning articles supplied by a carrier comprising:
a die having an aperture extending axially therethrough between entrance and exit openings of the aperture, the aperture being bounded in its interior on longitudinally opposite sides of its axis by planar wall portions parallel to such axis and extending axially between such openings
at least one guide ramp disposed in the aperture on one lateral side of the aperture, the ramp projecting laterally inward from that side towards the other lateral side of the aperture, and the ramp being positioned so as to be longitudinally spaced from each of the planar wall portions and to have at least its lower end lie in between them, the ramp having, for positioning severed articles, a guide surface disposed to face towards such other lateral side of said aperture and axially extending from a part of said ramp axially away from said exit opening to the exit opening to render the exit opening of rectangular "C" shape on said one lateral side, said guide surface having a slant to said



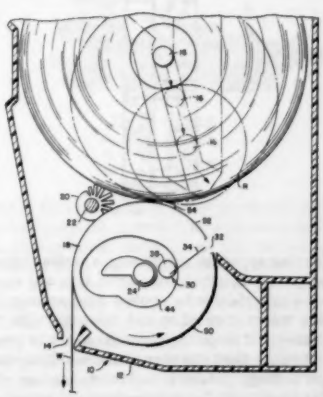
axis to approach closer to said other lateral side as said surface approaches closer to said exit opening; and
a punch movable coaxially with the axis to enter the aperture, the front face of the punch having longitudinally-spaced parallel article-severing edges receivable with an article-severing fit within the aperture's planar wall portions, and the punch having formed therein on said one lateral side of the aperture a cavity extending rearwardly from the front face and of a size and shape to receive the ramp so as to enable the front face of the punch to pass through the aperture to the exit opening.

4,441,392

CUT WEB MATERIAL DISPENSER WITH WEB CENTERING AND TENSION CONTROL

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Nov. 4, 1981, Ser. No. 318,278
Int. Cl.³ B26D *1/56*
U.S. Cl. 83—337 **3 Claims**



1. In a dispenser for rolled flexible sheet material having:
a chassis adapted to be attached to a wall;

means on said chassis for rotatably supporting a roll of flexible sheet material;

a feed roller rotatably mounted on said chassis providing guide means for a web of flexible sheet material drawn from the roll, said roller being disposed adjacent said supporting means to define a space between said roller and said supporting means for the roll carried by said supporting means to rest on said roller with said roller guide means guiding the web of flexible sheet material withdrawn from the roll to a user; and

cutter mechanism carried by said chassis in association with said feed roller for cutting the web at intervals along the web to divide the web into individual sheets;

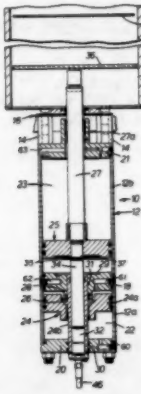
the improvement wherein said feed roller has at least one protrusion on the peripheral surface near each end thereof for momentarily lifting the roll of flexible sheet material off the surface of said feed roller during rotation of said feed roller so as to jar the roll carried by said supporting means into parallelism with the feed roller and free the web momentarily to permit any loose loop of web to be pulled out by the user.

4,441,393

METERING APPARATUS

Michael P. Anderson, Park Orchards, Australia, assignor to Kovan Engineering Pty. Ltd., Australia

Filed Nov. 17, 1981, Ser. No. 322,177
Claims priority, application Australia, Nov. 24, 1980, PE1598
Int. Cl.³ B29F *1/06*
U.S. Cl. 83—360 **12 Claims**



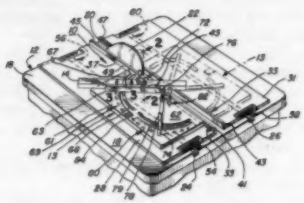
1. Metering apparatus comprising: a casing defining spaced first and second chambers; respective first and second piston means sealingly slidable by applied fluid pressure in the said chambers; means coupled to and moveable with the second piston means, and projecting from the casing to receive a load to be metered; a third chamber within said first piston means; a plunger sealingly slidable in said third chamber; wherein said second and said third chambers are in communication whereby respective opposed transverse faces of said second piston means and said plunger are engageable to determine a limit position for the second piston means in said second chamber.

4,441,394

TABLE SAW GUIDE APPARATUS

Mario Barsotti, 3475 Burr St., Gary, Ind. 46406

Continuation-in-part of Ser. No. 327,822, Dec. 7, 1981. This application Aug. 30, 1982, Ser. No. 412,622
Int. Cl.³ B27B *27/06*
U.S. Cl. 83—409 **8 Claims**



1. Guide apparatus adapted for use with table saw equipment including a table having a table top and having a motor-driven upright saw blade, for cutting a workpiece, said table top including an upwardly facing groove extending parallel and spaced from the plane of the saw blade, comprising:

a generally flat guide plate adapted to overlie and directly engage the table top;

upstanding stop means connected to said plate and disposed adjacent to, and space laterally by a short distance from, the saw blade, said stop means having top edge surface means for resting the workpiece thereon and for guiding it therealong;

projection means being disposed on the underside of said plate and being adapted to fit securely within the table top groove for fixing said plate in place on the table top; and

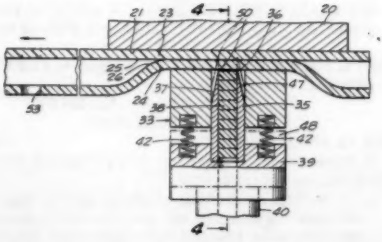
a substantially flat workpiece carrier being on and overlying the upper surface of said plate, said carrier adapted to engage said stop means for slidable engagement therewith, the upper surface of said workpiece carrier being flush with said top edge surface means to permit the workpiece to rest on top of said top edge surface means and said upper surface of said carrier, said carrier including gauge means mounted on the upper surface thereof for engaging the workpiece and for helping position it angularly relative to the saw blade.

4,441,395

TUBE PUNCHING METHOD

Jack W. McRoskey, Los Angeles, Calif., assignor to Republic Tool & Manufacturing Corporation, Carlsbad, Calif.

Filed Jun. 29, 1981, Ser. No. 278,788
Int. Cl.³ B26F *1/02*
U.S. Cl. 83—862 **4 Claims**



1. A method of cutting a hole in the wall of a flexible or pliable tube of the steps of:

a. flattening said tube to form first and second sidewalls

positioned adjacent to each other and having their surfaces in contact with each other,

b. cutting a plug in the first sidewall of said flat tube to form a hole therein by moving a plug cutting tool having a sharp cutting edge completely through said first wall and moving said plug cutting tool so that the cutting edge thereof will enter the surface of the second wall which acts as a back-up pad for said first wall, and

c. removing said plug cutting tool.

4,441,396

SLITTING MACHINE, MORE PARTICULARLY FOR HIDES AND LEATHER, UNWOVEN TEXTILE PRODUCTS, RUBBER PRODUCTS, PLASTICS IN PLATES OR ROLLS

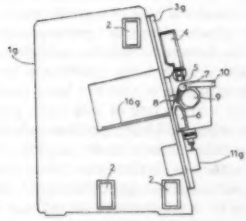
Georges Mercier, Annonay; Jacques Mercier, Andrezieux, and Pierre Buisson, Annonay, all of France, assignors to Societe MERCIER Freres, France

Filed Aug. 25, 1981, Ser. No. 296,001

Claims priority, application France, Sep. 3, 1980, 80 19375; Jul. 20, 1981, 81 14588

Int. Cl.³ C14B *1/18*

U.S. Cl. 83—871 **17 Claims**



1. Slitting machine, more particularly for hides and leather, unwoven textile products, rubber materials, plastics in plates, comprising a framework, a working table for presenting the materials or products to the slitting process, a driving device for said products or materials by means of two cylinders mounted in front of an endless cutting blade the upper and the driving of said cylinders being placed above and the lower cylinder, being a cylinder with elements, beneath the plane of the tensioned side of said endless cutting blade supported by two pulleys, at least one of which is motive and tensioning, the spacing between said cylinders being adjustable, a sharpening system constituted by two grinding wheels each one of which is acting on one of the two bevelled faces forming at the intersection thereof the cutting edge of said blade, said machine being characterized in that the bearing structure thereof is designed to divide parts of said machine in two distinct assemblies, namely: a fixed assembly carrying means for presenting, positioning and driving the products, disposed on either side of the cutting line and adjustable distinctly and separately with respect to this cutting line constituted by the cutting edge of the tensioned upper side of said endless blade; and an assembly which is mobile within the horizontal plane relative to the fixed assembly and includes a frame for the support of said blade, provided with means for guiding, positioning, driving and sharpening, said blade, the cutting edge of which is formed at the intersection of two sharpened bevelled faces and has an immutable position within the horizontal plane relative to said frame; said mobile assembly being movable relative to said fixed assembly of the structure to modify the spacing between the driving plane which is the imaginary plane passing through the axes of said upper driving cylinder and of said lower cylinder with elements supported by said blade positioned in an immutable manner within the horizontal plane relative to said mobile assembly.

4,441,397

Patent Not Issued For This Number

4,441,398

ANCHOR DEVICE FOR BASS DRUM

Newman T. Baker, 304 Catharine St., Philadelphia, Pa. 19147

Filed May 19, 1982, Ser. No. 379,603

Int. Cl.³ G10G *5/00*

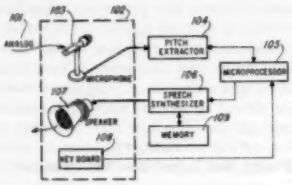
U.S. Cl. 84—421 **4 Claims**

1. An anchor for a bass drum or other percussion instrument adapted for being repetitively struck by a player, comprising a flexible mat having barrier means at one end, an area adjacent the barrier means to receive the instrument, and an area at the end opposite the barrier means to receive the player, said barrier means including an upward extended barrier strip mounted on the upper surface of said flexible mat and transversely along and superimposed on an end edge thereof, a lower block positioned and extending along and below said barrier strip and mat, said block elevating said mat end edge and said barrier strip and thereby creating a resistive force to said barrier strip resisting tipping thereof by forces applied thereagainst by a said instrument, said mat being compactly foldable about the barrier means for transport, and unfolded on a floor when in use.

4,441,399
INTERACTIVE DEVICE FOR TEACHING MUSICAL TONES OR MELODIES

Richard H. Wiggins, Dallas; George Doddington, Richardson, both of Tex., and Craig J. Cato, Littleton, Colo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 11, 1981, Ser. No. 301,089
Int. Cl.³ G09B 15/00
U.S. Cl. 84—470 R 16 Claims



1. An electronic learning aid for teaching musical tones comprising:

pitch indentifying means for determining at least a first pitch from an analog signal and producing a signal output indicative thereof;

memory means storing digital speech data and digital control data from which sythesized human speech relating to interaction between the electronic learning aid and an operator thereof may be derived, said memory means including storage in which the signal output from said pitch identifying means may be temporarily stored, and further including library means storing a plurality of pitch data representative of a plurality of different pitches and combinable into a plurality of different sequences of pitch data;

speech synthesizer means operably associated with said memory means for producing an analog signal alternatively representative of synthesized human speech or tones depending upon whether the data accessed from said memory means is digital speech data or pitch data;

operator input means for providing an operator input to said pitch identifying means as at least a tone in an analog signal representative thereof;

said pitch identifying means being responsive to an operator input from said operator input means as an analog signal for producing said signal output as determined by said operator input;

control means operably associated with said pitch identifying means, said memory means, and said speech synthesizer means and for selectively accessing digital speech data and pitch data from said memory means for input to said speech synthesizer means;

said memory means temporarily storing said signal output from said pitch identifying means as regulated by said control means for subsequent input to said speech synthesizer means upon selective access thereof by said control means,

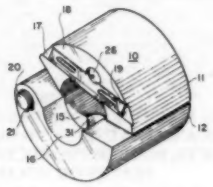
audio means coupled to said speech synthesizer means for converting said analog signals produced thereby alternatively into audible tones or audible synthesized human speech depending upon whether the data accessed from said memory means is pitch data or digital speech data; and

said speech synthesizer means and said audio means cooperating with said control means and said memory means in audibly providing at least a tone as the response of the electronic learning aid corresponding to said operator input and audible synthesized human speech commenting upon the response of the electronic learning aid to the operator input.

4,441,400
SHOTSHELL COMPONENT RECOVERY APPARATUS AND METHOD

Larry J. Sexton, 539 Wright St. Bldg. #3, Unit 204, Lakewood, Colo. 80228

Filed Jul. 26, 1982, Ser. No. 401,951
Int. Cl.³ C06B 21/00; F42B 33/10
U.S. Cl. 86—1 A 8 Claims



1. A device for cutting open plastic or paper-walled shot shell ammunition comprising:

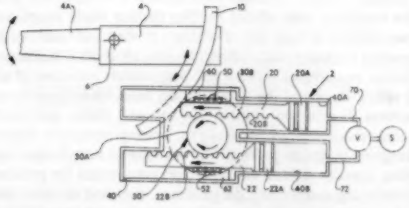
a plurality of rotatably connected semicylindrical body portions where at least one of said body portions extends axially beyond the other said body portion, said body portions being movable to define a first open position and a second closed position and when in the second closed position define a first bore therethrough, said one body portion containing at least two semicircular surfaces defining said first cylindrical bore of a predetermined diameter and a second cylindrical bore of a predetermined diameter smaller than the diameter of said first cylindrical bore, said second cylindrical bore being established on at least a portion of the extension of said one body portion,

cutting means located on one of said body portions positioned so that when said body portions are in the closed position, the cutting means extends into said second cylindrical bore a sufficient depth to cut through the wall of a shot shell placed in said second cylindrical bore, whereby a shotshell can be opened when inserted into said second cylindrical bore and rotated after closing said body portions.

4,441,401
RACK AND PINION WEAPON ELEVATION MECHANISM

James C. Hobson, St. Clair Shores, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 27, 1982, Ser. No. 423,583
Int. Cl.³ F41F 21/16, 21/04, 23/06, 23/10
U.S. Cl. 89—37 F 8 Claims



1. An elevation mechanism for an unbalanced weapon having driven gear means, comprising a rotatably mounted pinion means in meshing engagement with the driven gear means to elevate or depress the weapon depending on the direction of pinion rotation, a pair of rack means in meshing engagement with said pinion means with one rack means slidably mounted

on a side of the pinion means and the other rack means slidably mounted on a side thereof such that said one rack means causes elevation of the weapon and said other rack means causing depression of the weapon, means for moving said rack means past the pinion means to rotate same in one direction or the other, and further comprising a third rack means in meshing engagement with the pinion means and means for loading the third rack means against the pinion means to exert a torque thereon counter to a torque exerted on the pinion means by the unbalanced weapon.

4,441,402

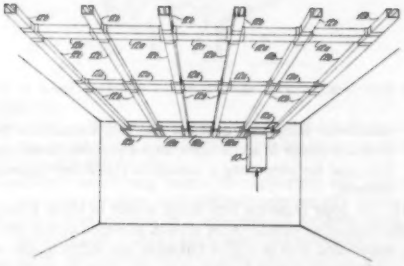
AESTHETIC ACOUSTICAL AIR DISTRIBUTION DUCT SYSTEM

David A. Harris, Sylvania, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 260,240, May 4, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,919

Int. Cl.³ F24F *7/06*

U.S. Cl. 98—40 C **4 Claims**



1. An air distribution duct system suitable as a retrofit air distribution system for a room of an existing building and also providing an aesthetic acoustical treatment for a ceiling of the room, the system comprising a plurality of parallel duct runs extending in a first direction and a plurality of parallel duct runs extending in a second direction perpendicular to the first direction, the duct runs extending in the first direction being at the same height as and being interconnected to the duct runs extending in the second direction, each of the duct runs including duct sections of rectangular shape suspended from the ceiling of the room in spaced relationship thereto and formed of fabricated sound absorbent fibrous board whereby a grid pattern of rectangular sound absorbent duct runs is provided in spaced relationship to the ceiling for absorbing sounds emanating from sources in the room outside of the duct sections, the rectangular duct sections surrounding each open area in the grid pattern forming a pocket for the trapping of sound thereafter absorbed in the sound absorbent fibrous board of the duct sections, and some of the duct sections of the duct runs extending in one of said directions having air distribution openings for distribution of conditioned air into the room.

4,441,403

AERATION FAN MOUNTING SYSTEM

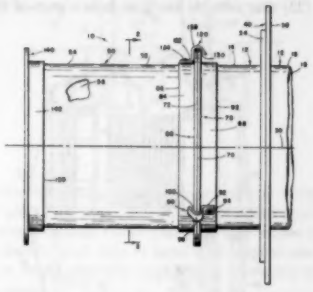
James L. Hansen, P.O. Box 233, Crofton, Nebr. 68730

Filed Apr. 7, 1980, Ser. No. 138,146

Int. Cl.³ F16L *37/26*; **E04H** *7/22*

U.S. Cl. 98—55 **1 Claim**

1. An aeration fan mounting system comprising a grain storage building, a wall adapter mounted on said building, a fan housing adapted to have a fan of a size suitable for grain aeration mounted therein, said adapter and fan housing having aligned cylindrical interior and exterior surfaces having a same horizontal axis, said wall adapter and said fan housing being arranged end-to-end adjacent each other, said wall adapter and said fan housing having on the cylindrical exterior surfaces thereof wall adapter-mounted and fan housing-mounted insertion rings thereon and protruding outwardly therefrom substantially radially of said axis and means retaining said wall adapter insertion ring and said fan housing mounted insertion ring on said wall adapter and fan housing, respectively, wall adapter-mounted support bracket means providing upwardly opening support recess means receiving said fan-mounted insertion ring and disposed on opposite sides of said horizontal axis as seen in top plan view at first and second horizontally spaced support points and means securing said support bracket means to said wall adapter mounted insertion ring, a holding bracket means providing a downwardly opening holding recess means disposed above said upwardly opening support recess means and removably receiving said fan-mounted insertion ring whereby as said fan housing is lifted with respect to said wall adapter said fan housing-mounted bracket means is removed from the upper side of said adapter-mounted insertion ring, said support recess means of each of said bracket means being progressively narrower towards its radially outermost portion so as to guide said insertion rings toward each other whereby said fan housing is guided toward said adapter and whereby accuracy of initial placement of said rings in said recesses is not as critical and yet said rings are drawn into a close fit and in axial alignment with each other.



4,441,404

VENTILATION APPARATUS

Johnathan G. Simon, Great Torrington, England, assignor to R. W. Simon Limited, North Devon, England

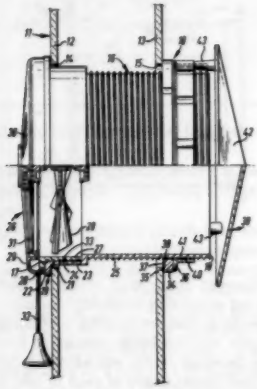
Continuation of Ser. No. 319,937, Nov. 10, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 501,970

Int. Cl.³ E06B *7/02*

U.S. Cl. 98—96 **2 Claims**

1. Ventilating apparatus (**10**) for transferring air from one to another of a pair of spaces that are separated by a pair of spaced apart substantially parallel fixed panels (**12, 13**), said panels having aligned apertures (**14, 15**) therein and a substantially inaccessible air space therebetween, said apparatus (**10**) comprising: a one-piece hollow cylindrical rigid member (**16**) receivable in said aligned apertures (**14, 15**) in said panels (**12, 13**) to extend through both of said apertures (**14, 15**) and across said air space between said panels (**12, 13**), said cylindrical rigid member (**16**) having an external surface and an internal surface, said external surface comprising an external first screw thread (**25**) that extends along at least a part of the length of said cylindrical rigid member (**16**) from one end thereof, said internal surface comprising an internal second screw thread (**24**) that extends along at least a part of the length of said cylindrical rigid member (**16**) from the other end thereof, and said cylindrical rigid member (**16**) having near its said other end a radially outwardly projecting circumferential flange (**19**) for sealing engagement with the outer side of one (**12**) of said panels to prevent air flow between said cylindrical rigid member (**16**) and an edge of the aperture (**14**) in said one panel (**12**); a rotatable annular member (**34**) having an inner surface

formed as a third screw thread (38) complementary to and engageable with said external first screw thread (25) and axially adjustable by rotation on said cylindrical rigid member (16) for sealing engagement with the outer side of the other (13) of said panels to prevent air flow between said cylindrical rigid member (16) and an edge of the aperture (15) in said other panel (13) and cooperable with said flange (19) for securing the cylindrical rigid member (16) against displacement relative to said panels (12, 13); an air flow controlling component (26) comprising a housing (27) and having means (28, 29, 30, 31) on said housing (27) for controlling air flow through said hollow cylindrical rigid member (16), said housing (27) having a cylindrical external surface comprising an external fourth screw thread (33) that extends along at least a part of the length of



said housing (27) and is complementary to and engageable with said internal second screw thread (24) in the cylindrical rigid member (16) whereby said component (26) is removably received in said cylindrical rigid member (16) near said other end thereof, and means on said housing (27) engageable with said cylindrical rigid member (16) to limit the extent to which said housing (27) is insertable into said cylindrical rigid member (16), said part of said cylindrical rigid member (16) along which said internal second screw thread (24) extends has a larger inside diameter than the remainder thereof, adhesive sealing means for disposition between said flange (19) and said one panel (12) and between said annular member (34) and said other panel (13), said means for controlling air flow comprises a fan (28) and a shutter mechanism (31) mounted on said housing (27).

4,441,405

SOLAR RADIATION HEAT INFLUX SENSOR FOR AN AUTOMOTIVE VEHICLE

Yasuhisa Takeuchi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 22, 1982, Ser. No. 350,883

Claims priority, application Japan, Mar. 12, 1981, 56-34535; Mar. 18, 1981, 56-39184

Int. Cl.³ B60H *1/00*; G01K *17/00*

U.S. Cl. 98—201 **12 Claims**

1. A solar radiation heat influx sensor adapted to be mounted on an automotive vehicle having windows for determining heat influx into a passenger compartment due to sunlight, comprising:

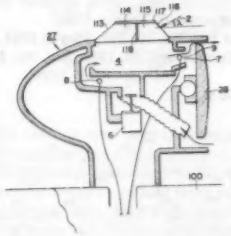
(a) a sensor body having an air inlet portion and an air outlet portion at opposite ends thereof and a model window having similar solar characteristics to the vehicle windows, said model window being disposed between the air inlet and outlet portions of said sensor body and operable to receive rays of sunlight incident on said vehicle;

(b) means for driving air through said sensor body from the air inlet portion to the air outlet portion;

(c) an outside-air temperature sensor disposed in the air inlet portion of said sensor body for detecting the temperature of air flowing into said sensor body;

(d) a warmed-air temperature sensor disposed in the air outlet portion of said sensor body for detecting the temperature of air flowing out of said sensor body; and

(e) a calculating unit, connected to said outside-air temperature sensor and said warmed-air temperature sensor, for calculating heat influx into the passenger compartment due to sunlight on the basis of signals generated by said



outside-air temperature sensor and said warmed-air temperature sensor in accordance with a predetermined equation, and for outputting a command signal corresponding thereto.

11. The solar radiation heat influx sensor of claim 1 further comprising an air-conditioning system, mounted in said vehicle and asssociated with said solar radiation heat influx sensor, said air-conditioning system having an air mix door for controlling the temperature of the air admitted into said passenger compartment, and means for controlling the position of said air mix door, wherein said calculating unit is operable to generate said command signal to operate said means for controlling the position of the air mix door.

4,441,406

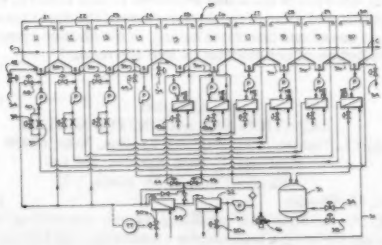
PASTEURIZATION APPARATUS

Kenneth W. Becker, Brookfield; Louis G. Friedrichs, Jr., Milwaukee; Lev Kropp, Glendale, and Richard B. Straka, Milwaukee, all of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Filed Jun. 14, 1982, Ser. No. 388,211

Int. Cl.³ A61L *2/04*

U.S. Cl. 99—275 **12 Claims**



1. In a tunnel pasteurizer in which the product to be pasteurized is successively moved on a conveyor through a preheat zone, a pasteurizing zone and a precool zone, the improvement which comprises cooling means in the pasteurizing zone for cooling the product in the pasteurizing zone to a temperature at which no appreciable pasteurization occurs when the con-

veyor stops, thus preventing the overpasteurization of the product.

4,441,407

HORIZONTAL CONTAINER FOR PROCESSING WINE GRAPE MUST

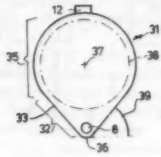
Herbert Rieger, Talstrasse 33, 7121 Ingersheim, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,302

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3101510; Apr. 18, 1981, 3115633

Int. Cl.³ C12G *1/02*

U.S. Cl. 99—277.2 **14 Claims**



1. A wine tank for stationary use in a winery, said tank comprising

an upper tank portion corresponding substantially in shape to a major portion of a circular cylinder having a substantially horizontal axis,

stationary supporting means for supporting said tank in a stationary position with said axis substantially horizontal,

a lower tank portion of a substantially tapered form and having a pair of side walls connecting smoothly with said upper tank portion and extending downwardly therefrom while converging toward each other,

said side walls ranging from zero curvature to a slight curvature having a radius of curvature which is substantially greater than the radius of curvature of said upper tank portion,

each of said side walls extending downwardly at an angle of at least 30° relative to the horizontal,

and a bottom wall portion substantially in the form of a circular cylindrical segment into which the lower portions of said side walls merge,

said bottom wall portion being connected between the lower portions of said side walls and constituting a discharge drainage trough,

said downward angle of at least 30° of said side walls being sufficiently great to cause discharge of wine pomace by gravity while minimizing the accumulation of wine pomace on said side walls.

4,441,408

MACHINE FOR FORMING CROISSANTS AND THE LIKE CONFECTIONERY PRODUCTS

Maurizio D. Costa, Via Trento, 36, 20090 Cesano Boscone (Milano), Italy

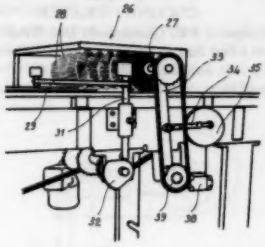
Filed May 3, 1982, Ser. No. 374,432

Claims priority, application Italy, Jan. 26, 1982, 19310 A/82

Int. Cl.³ A21C *9/08, 11/10*; A21J *11/00*

U.S. Cl. 99—450.2 **6 Claims**

1. A machine for forming croissants and like pastry products, comprising a holding device for temporarily holding a plurality of oncoming rolled up pastry pieces aligned across an oncoming direction, conveyor means for conveying baking pans under said holding device, said baking pans having a plurality of arcuate recesses for said pastry pieces and said holding device having means for causing said pastry pieces to fall onto said baking pans in corresponding relationship with said recesses, and a bending station arranged downstream of said holding device and having means for arcuately bending said pastry pieces to be received in said recesses of said baking pans, wherein said means for bending said pastry pieces comprise a shaft extending transverse to said oncoming direction of said pastry pieces, pairs of brushes arranged spaced apart from one another on said shaft, a rod extending transverse to said oncoming direction proximate to said shaft, a plurality of projecting lug portions provided on said rod such that each of



said lug portions is arrnged between and below a respective one of said pairs of brushes, and means for rotating said shaft and translating said shaft relative to said lug portions for causing the brushes of each pair to bend a respective one of said pastry pieces when centrally engaged by a respective one of said lug portions.

4,441,409

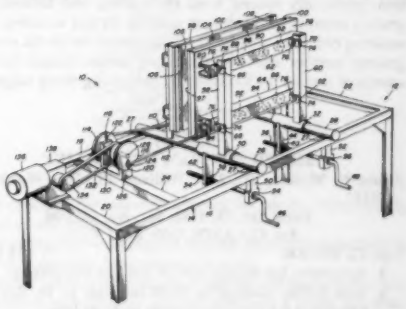
APPARATUS FOR BLANCHING PEANUTS

Lowell E. Weyant, Edenton, N.C., assignor to Seabrook Blanching Corporation, Albany, Ga.

Filed Sep. 20, 1982, Ser. No. 419,818

Int. Cl.³ B02B *3/00*

U.S. Cl. 99—523 **4 Claims**



1. Apparatus for blanching edible shelled nuts, comprising:

(a) a pair of members mounted in spaced opposed parallel relation to one another to define a gap therebetween, said gap being adjustable to the average thickness of said nuts;

(b) each of said members formed with a generally flat vertical face, both of said faces being generally coextensive with one another and in opposite facing relation to one another;

(c) both of said faces being of an abrasive character,

(d) means for mounting said pair of members for oscillating lengthwise movement along parallel paths and out of phase with one another;

(e) drive means operatively connected to said pair of members for oscillating said members in parallel whereby nuts delivered into the upper end of said gap will be blanched as said nuts move downwardly through said gap for discharge from the lower end of said gap; and

(f) stroke adjustment means connected to said mounting

means and said drive means for selectively adjusting said oscillating lengthwise parallel movement of said pair of members;

(g) each of said flat vertical faces formed with a vertical groove along the marginal vertical edges thereof.

4,441,410

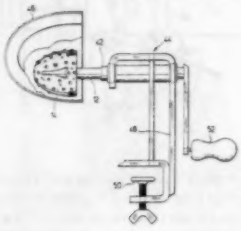
COCONUT GRATER

Noel A. Thompson, 8 E. Charlemont Dr., Kingston 6, Jamaica

Filed Jun. 1, 1982, Ser. No. 383,443

Int. Cl.³ A23N *5/03, 5/08*

U.S. Cl. 99—538 **9 Claims**



1. A coconut grater for grating and removing the coconut flesh from the interior of a coconut shell, comprising a rotatable shaft having a leading end, a plurality of separate curved grating members each having a front portion, securing means securing each front portion to the leading end of the shaft, each grating member curving outwardly and rearwardly from the front portion to extend in spaced relation to the shaft and form an interior area having an open back end, a plurality of angularly spaced struts extending radially from the shaft at a location rearwardly spaced from the leading end thereof, each grating member having a rear portion, further securing means securing each rear portion to at least one of the struts, and each grating member also having grating means formed by small apertures therein with outwardly projecting sharp edges.

4,441,411

SLICER FOR HAM OR THE LIKE

James N. Mullins, Jr., 2116 Williams Pl., Fort Worth, Tex. 76111

Filed Apr. 25, 1983, Ser. No. 488,034

Int. Cl.³ A23N *7/00;* **A47J** *17/00*

U.S. Cl. 99—538 **11 Claims**

1. Apparatus for slicing ham or the like comprising:

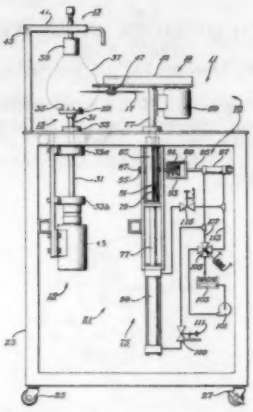
a. ham holder adapted to hold the ham to be sliced and journalled for rotation so as to spin the ham;

b. ham rotating means connected with said ham holder for rotating said ham holder and the ham therewithin;

c. rotary slicer blade journalled for rotation for slicing the ham when in cutting engagement therewith;

d. blade rotating means connected with said blade for rotating said blade;

e. lateral and upward moving means for moving said blade into and out of cutting engagement with the ham; said lateral and upward moving means having sufficient force to move the rotating blade in cutting engagement with the ham through the ham to its bone and adapted to reciprocate as necessary to accommodate said bone; said lateral and upward moving means having easily rate-adjustable upward moving means adapted for moving said blade upwardly in a proper direction slowly while simultaneously moving the blade into cutting engagement with the ham such that a continuous spiral slice is effected through the ham and about said bone; said lateral and upward moving means having the capability of an infinite number of adjustments of very small or large nature in the rate of movement of the upward moving means such that



very small changes in thickness of the ham slices can be effected and different thickness slices can be cut.

4,441,412

DRIVING DEVICE OF SORTING CYLINDER FOR USE IN A ROTARY TYPE RICE HULLING AND SORTING DEVICE

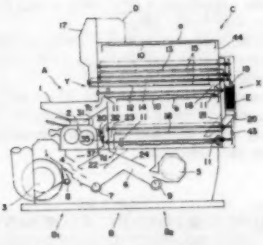
Ryuichi Imamura; Kanzo Shimazaki; Satoru Yahashi; Takashi Yamamoto, and Noriyuki Yano, all of Nangoku, Japan, assignors to Yanma Agricultural Equipment Company Limited, Osaka and Seirei Industry Company Limited, Okayama, both of, Japan

Filed Jan. 24, 1983, Ser. No. 460,636

Claims priority, application Japan, Jan. 25, 1982, 57-8889; Mar. 10, 1982, 57-34430

Int. Cl.³ B02B *3/00, 3/04, 7/02*

U.S. Cl. 99—601 **3 Claims**



1. A driving device of sorting cylinders for use in a rotary type rice hulling and sorting device, comprising: a means for hulling, a pneumatic means for sorting and a means for rotary sorting having at least two sorting cylinders rotatably mounted therein having two ends, with one end of said sorting cylinders being adapted to serve as the feeding side for rice grains to be sorted and the other end of said sorting cylinders being adapted to serve as the discharging side for rice grains which are to be hulled and sorted, the sorting cylinders having a large number of recesses formed on the internal surface thereof, and further having receiving troughs for taking out the rice grains scooped up by said recesses; said means for hulling, said pneumatic means for sorting and said means for rotary sorting being assembled together, the rotational speed of said sorting cylinders being selectively controllable regardless of the rate of revolution of said means for hulling and said pneumatic means

for sorting, power from a prime mover being transmitted from a driving shaft of said hulling part to a drive axis of said means for rotary sorting, the drive axis of said means for rotary sorting also being operable to drive other devices;

said means for hulling and said means for rotary sorting being mounted in parallel on said pneumatic means for sorting;

said means for hulling and said pneumatic means for sorting being connectedly driven by a prime mover;

a driving shaft of said means for hulling being connected to a V-belt of said means for rotary sorting through a V-belt for transmitting power;

said means for rotary sorting further comprising a primary sorting cylinder mounted above, and arranged in parallel with, a secondary sorting cylinder;

said primary sorting cylinder being opened to an unhulled rice tank through a discharging end of said primary sorting cylinder;

said pneumatic means for sorting further comprising a trough for receiving hulled rice grains;

said secondary sorting cylinder being opened to said trough for receiving hulled rice grains through a discharging side of said secondary sorting cylinder.

4,441,413

PINEAPPLE CUTTER

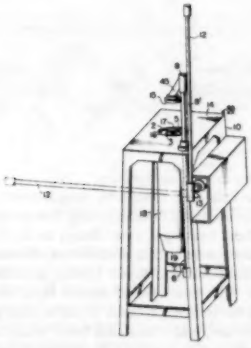
Kashichi Mori, Iwatsuki, Japan, assignor to Kowa Shoji Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,952

Claims priority, application Japan, Aug. 1, 1981, 56-115130[U]

Int. Cl.³ A23N *4/00, 4/20, 7/08*

U.S. Cl. 99—542 **12 Claims**



1. A pineapple cutter for removing the peel and core of a pineapple, comprising:

a cylindrical body having a base disk at one end and being open at the other end;

a first tubular cutter for cutting the core of said pineapple, said tubular cutter being connected to said base disk and having a first diameter;

a second tubular cutter for peeling said pineapple, said second cutter having a second diameter larger than said first cutter and being mounted on the open circular edge of said cylindrical body, said first and second cutters being concentric;

an annular loading table, said first cutter passing through a central opening in said loading table with wide clearance, said loading table fitting with wide clearance within said second tubular cutter;

a rod connected to said loading table, said rod being adapted to move and translate said loading table within said cylindrical body in a direction parallel to the longitudinal axis of said cylindrical body and said tubular cutters, said rod passing through a slanting groove provided in the side wall of said cylindrical body, said groove being non-parallel to the longitudinal axis of said cylindrical body, said cylindrical body, said second tubular cutter and said first tubular cutter being rotated relative to said loading table when said rod moves and translates said loading table parallel to said longitudinal axis;

means for moving said rod;

a pressing disk connected to said rod at a position displaced from said loading table and moving with said rod, the spacing between said loading table and said pressing disk corresponding to the length of a pineapple prepared to be peeled and cored.

4,441,414

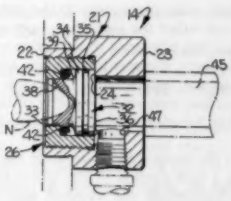
CRACKING DIE ASSEMBLY FOR HIGH PRODUCTION NUT CRACKING APPARATUS

James B. Quantz, Columbia, S.C., assignor to Machine Design Incorporated, Columbia, S.C.

Continuation-in-part of Ser. No. 372,305, Apr. 27, 1982, Pat. No. 4,418,617, which is a division of Ser. No. 199,743, Oct. 23, 1980, Pat. No. 4,332,827. This application Jul. 1, 1983, Ser. No. 509,917

Int. Cl.³ A23N *5/02*

U.S. Cl. 99—571 **12 Claims**



1. A cracking die assembly adapted for use in a nutcracking apparatus, and comprising

a mounting sleeve having an internal bore which includes a radial shoulder intermediate its ends,

a tubular retainer coaxially mounted in said sleeve bore, said retainer including an internal bore and a radial shoulder which is spaced oppositely from said sleeve shoulder,

a cracking die disposed coaxially within said bore of said sleeve and including a radial flange disposed between said retainer shoulder and said sleeve shoulder, with said flange having an axial dimension less than the distance between said shoulders for permitting limited axial movement of said die, and with said die having a first end surface which is adapted to engage the end of a nut to be cracked, and an opposite end surface, and

resilient annular gasket means disposed between said radial flange of said die and one of either said sleeve shoulder or said retainer shoulder, and so as to be disposed on the side of said flange toward said first end surface of said die,

whereby said cracking die is adapted to be impacted on said opposite end surface and be thrust forwardly a limited distance so as to impart a cracking force to a nut engaged by said first end surface of said die, and with the annular gasket means adapted to absorb at least a portion of the impacting force.

4,441,415

CRUSHER FOR SCRAP METAL AND THE LIKE

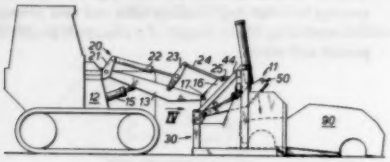
Peter A. T. Hawkins, White Cross Farm, Cholsey, Oxfordshire, England

Filed Dec. 1, 1981, Ser. No. 326,420

Claims priority, application United Kingdom, Dec. 5, 1980, 8039004; Jun. 26, 1981, 8119865

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—35 **23 Claims**



1. A method of crushing scrap metal and the like, comprising:

(a) providing a jaw mechanism comprising a lower jaw member having a platform pivotally connected to an upper jaw member including a press plate which has a single generally planar operative surface, the axis of said pivotal connection being offset such that, when the platform is horizontal, the axis is above and entirely beyond one side of the platform, that side thereby being defined as the rear of the platform and the jaw mechanism including side pieces diverging towards the rear of the platform for guiding and containing scrap metal on either side of the jaw mechanism;

(b) loading a leading end of an object to be crushed on to the platform from a side opposite the above-defined rear thereof;

(c) urging the press plate towards the platform to crush the object until either the said single operative surface of the press plate has advanced to a position where it is parallel to the platform, is closer to the plane of the platform than is the said axis and, seen in plan view, does not extend across the said axis, or the rigidity of the object prevents the further advance of the press plate towards that position;

(d) moving the press plate away from the platform;

(e) loading a next portion of the object on to the platform while withdrawing the crushed end through the side pieces and from the rear of the platform; and

(f) repeating steps (c), (d) and (e) in sequence until the entire object has been crushed and withdrawn from the rear of the platform.

4,441,416

PRESSURE FIXING DEVICE

Teruo Tsutsumi, Tama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 14, 1982, Ser. No. 417,999

Claims priority, application Japan, Sep. 19, 1981, 56-147016; Dec. 11, 1981, 56-198659; May 11, 1982, 57-77510

Int. Cl.³ B30B *3/02*

U.S. Cl. 100—171 **8 Claims**

1. A pressure fixing device for a recording medium comprising:

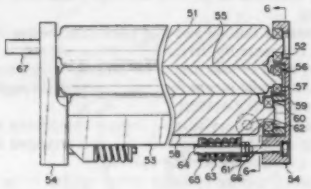
a pair of frames spaced and facing each other;

a first roll located between the frames so that both ends of the first roll are supported individually by the frames for rotation;

a pair of guide members attached individually to the frames to be movable at right angles to the axis of the first roll;

a second roll disposed along the first roll so that both ends of the second roll are supported individually by the guide members for rotation, the recording medium being passed between the first and second rolls; and

a mechanism for urging the second roll toward the first roll, the mechanism including a pair of compression coil springs extending along the axes of the rolls to apply an urging force in its extending direction, a pair of pressure levers rockable around an axis normal to the axes of the



rolls and the moving direction of the guide members, the pressure levers receiving the urging force of the coil springs to urge the second roll toward the first roll, and adjusting means for adjusting the urging force of the compression coil springs.

4,441,417

PRESSURE FIXING DEVICE

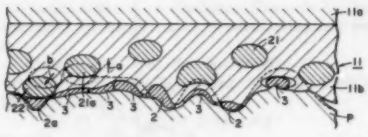
Masahiro Katayama, Kawasaki; Nobutoshi Yoshida, Yokohama, and Tsukasa Kuge, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1981, Ser. No. 315,517

Claims priority, application Japan, Oct. 30, 1980, 55-155350[U]

Int. Cl.³ B30B *3/04*

U.S. Cl. 100—176 **22 Claims**



1. A pressure fixing device comprising:

a pair of rotatable unheated members, which contact each other along a narrow band defining a nip, for pressing and transmitting a sheet bearing a toner image to fix the toner image on the sheet, at least one of said rotatable members including an elastic surface layer having particles of a hardness higher than that of said elastic layer dispersed therein so as to be present at least in the vicinity of the outer surface thereof, and when said toner image is fixed on the sheet between said rotatable unheated members, said particles deform said elastic so that the outer surface of said elastic layer follows the concave-convex surface of the sheet; and

means for applying sufficient linear pressure to said pair of rotatable members so that the pressure at the nip is at least at the required peak pressure to deform the toner in order to effectively adhere the toner to the sheet by pressure alone.

4,441,418

OVERVARNISH APPARATUS FOR DECORATOR MACHINE

Roger A. Hahn, Arvada, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Feb. 3, 1982, Ser. No. 345,321

Int. Cl.³ B41F *17/08*

U.S. Cl. 101—38 R **11 Claims**

1. Apparatus for decorating cans or the like comprising:

a mandrel wheel means having a plurality of circumferentially spaced rotatable mandrel means for carrying cans in

a generally circular path of movement past inking means for applying ink images to the peripheral surfaces of the cans;

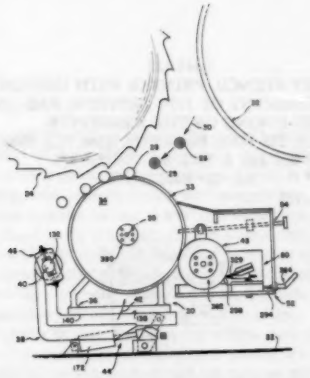
an applicator roll means located next adjacent and downstream of said inking means and being engageable with the peripheral surfaces of the cans for applying a coating material over the ink images on the peripheral surfaces of the cans;

a pre-spin wheel means operatively associated with said applicator roll means and being engageable with said rotatable mandrel means before said applicator roll means engages the peripheral surfaces of the cans for causing rotation of said rotatable mandrel means prior to engagement of said applicator roll means with the peripheral surfaces of the cans;

a single engraved meter roll means mounted in juxtaposition to and engaging said applicator roll means for applying a coating material to said applicator roll means;

a fountain means having a reservoir for holding a quantity of the coating material and metering blade means operably associated with said meter roll means for applying a predetermined quantity of coating material to said meter roll means;

drive means operably connected to said applicator roll means and said pre-spin wheel means and said meter roll means for causing synchronized rotation thereof;



a common movable support means for supporting said applicator roll means and said pre-spin wheel means and said meter roll means and said fountain means for movement between an operational position adjacent said mandrel wheel means whereat said applicator roll means engages the peripheral surfaces of the cans and an inoperative position whereat said applicator roll means is spaced from the peripheral surfaces of the cans;

actuating means operably associated with said common movable support means for selectively moving said common movable support means between the operative position and the inoperative position;

an applicator roll pressure adjustment means operably associated with said common movable support means for causing variable movement thereof in the operative position whereby the position and engaging pressure of said applicator roll means relative to the cans is selectively variably adjustable;

a meter roll pressure adjustment means mounted on said common movable support means and being operably associated with said meter roll means for selectively variably adjusting the position and engaging pressure of said meter roll means with said applicator roll means;

fountain adjustment means mounted on said common movable support means and being operably associated with said fountain means for selectively variably adjusting the position of said fountain means relative to said meter roll means to control the amount and distribution of coating material transferred from said fountain means to said meter roll means; and

support adjustment means operatively associated with said common movable support means for selectively variably adjusting the axis of rotation of said applicator roll means relative to the axis of rotation of said mandrel means to maintain substantial parallelism therebetween.

4,441,419

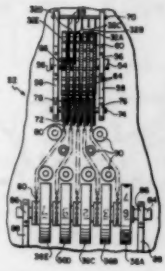
IMPRINTING DEVICE AND DIGIT WHEEL ASSEMBLY THEREFOR

William A Sours, Saugoit, N.Y., assignor to National Business Systems, Inc., Mississauga, Canada

Continuation of Ser. No. 310,905, filed as PCT US /80/01418, Oct. 22, 1980, § 102(e) Sep. 9, 1981, publish as WO 82/01344, Apr. 29, 1982, abandoned. This application Dec. 1, 1982, Ser. No. 446,161

Int. Cl.³ B41F *3/04*

U.S. Cl. 101—45 **6 Claims**



1. A digit wheel assembly for use in connection with a variable imprinting device, comprising:

(a) a plurality of digit wheels rotatably mounted on a common fixed digit wheel shaft, each of said digit wheels having raised printing indicia spaced along the circumference thereof;

(b) a plurality of thumbwheels rotatably mounted on a common fixed thumbwheel shaft, said thumbwheels being equal in number to said plurality of digit wheels,

(c) a first plurality of sprockets equal in number to said plurality of digit wheels, each of said first plurality of sprockets having multiple adjacent semi-spherical recesses evenly spaced around the periphery thereof, and each of said first plurality of sprockets being operatively associated with one of said digit wheels so as to rotate therewith;

(d) a second plurality of sprockets equal in number to said plurality of digit wheels, each of said second plurality of sprockets having multiple adjacent semi-spherical recesses evenly spaced around the periphery thereof, each of said second plurality of sprockets being operatively associated with one of said thumbwheels so as to rotate therewith; and said second plurality of sprockets having different center-to-center spacing from the center-to-center spacing of said first plurality of sprockets,

(e) a plurality of endless bead chains equal in number to said plurality of digit wheels, each of said endless bead chains comprising a series of connected spherical segments,

and each endless bead chain connecting one of said first plurality of sprockets to one of said second plurality of sprockets by having spherical segments for each endless bead chain being retained in said semi-spherical recesses of said first and second plurality of sprockets; and,

(f) bosses mounted vertically with respect to said digit wheel shaft and said thumbwheel shaft for causing those endless bead chains which connect sprockets not aligned with one another to bend so that each of said endless bead chains is maintained in positions which result in the linear relation-

ship of said spherical segments, at said sprockets, to be perpendicular to the rotational axes of said first and second plurality of sprockets;

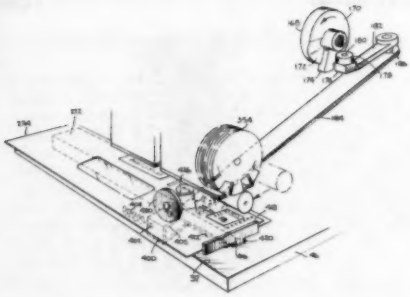
whereby synchronization is maintained between the rotational position of said digit wheel operatively associated with said first sprocket and the rotational position of said thumbwheel operatively associated with said second sprocket.

4,441,420

ENVELOPE EJECTION MECHANISM FOR A MAILING MACHINE

Danilo P. Buan, Easton, Conn., and Ezra Navok, New York, N.Y., assignors to Pitney Bowes, Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,811
Int. Cl.³ B41J *45/00*
U.S. Cl. 101—69 **9 Claims**



1. A mailing machine having an envelope ejection mechanism, comprising: a housing having a slot with a stationary deck, said deck having an opening therein, a movable platen receivable within said opening of said deck, a print head spaced from and addressing said platen, means for moving said platen into said slot toward and away from said print head, said stationary deck having a channel formed therein on one end of said opening and located adjacent said platen, means received within said channel for ejecting an envelope from said slot, means for moving said ejection means across said deck after said platen has been driven toward and away from said print head and means supported by said housing for applying pressure upon an envelope located upon said deck whereby upon said ejection means acting upon the envelope and said pressure means will cause the envelope and its contents to move in unison.

4,441,421

PRINT HAMMER APPARATUS

Hossein Khorsand, 33042 Commodore Ct., San Juan Capistrano, Calif. 92675

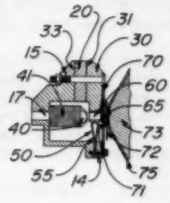
Filed Sep. 22, 1982, Ser. No. 421,236
Int. Cl.³ B41J *3/00*
U.S. Cl. 101—93.04 **10 Claims**

1. Print hammer apparatus comprising:

a permanent magnet;

a first pole piece and a second pole piece in magnetic contact with opposing poles of said permanent magnet, one and only one of said pole pieces defining a slot for receiving a hammer head and effectively encompassing the hammer head for focusing magnetic flux onto said hammer head;

a hammer including a flexible mounting element having a fixed end and a free end, the free end provided with a magnetic hammer head and a stylus, said hammer head receivable within said slot of said pole piece, said slot consisting of a recess in said pole piece having the same general cross sectional shape as the cross sectional shape of said hammer head, and of a size so as to provide a minute air gap between said slot and said hammer head, each hammer normally being held in a retracted flexed position; and



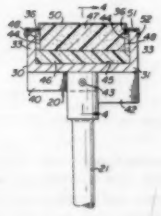
an electromagnet, which when activated is operable to provide a magnetic flux of sufficient magnitude to cancel the magnetic flux of said permanent magnet to release the hammer head from its retracted position for printing.

4,441,422

CAPILLARY STENCIL PRINTER WITH IMPROVED REPLENISHMENT OF THE PRINTING PAD AND RE-INKING OF THE RESERVOIR

Lionel Dreeben, 525 White Horse Pike, Atco, N.J. 08004

Filed Jan. 8, 1982, Ser. No. 337,976
Int. Cl.³ B41L *27/26*
U.S. Cl. 101—125 **3 Claims**



1. A stencil printer for printing the underside of a web, said printer comprising a receptacle mounted for vertical reciprocation beneath the web, said receptacle having an opening facing upwardly toward the web, two opposite sides of said opening having spacer elements projecting into said opening a reservoir pad consisting of glass beads in a lower interior region of said receptacle adaped to rapidly absorb a large quantity of ink, an ink absorbing capillary printing pad in an upper region of said receptacle between said spacer elements and in contacting fluid communication with said reservoir body and adapted to slowly absorb ink from the latter, gravitational ink replenishing means in said receptacle communicating downwardly between said spacer elements, said printing pad and the sides of said opening from exteriorly of and over said receptacle into said receptacle to said reservoir body for gravitationally replenishing ink to the reservoir body, and stencil holding means for holding a stencil on the upper surface of said printing pad to print through said stencil, said stencil holding means, when in place, closing said gravitational ink replenishing means.

4,441,423

COLLECT-PRINTING UNIT FOR SECURITY PRINTING FOR USE IN A ROTARY PRINTING PRESS

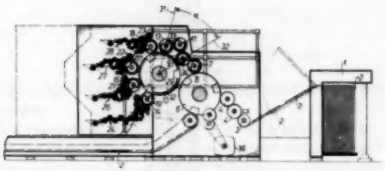
Albrecht J. Germann, Wurzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,392

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, 3109964

Int. Cl.³ B41F 5/16

U.S. Cl. 101—175 12 Claims



1. A collect-printing unit for the indirect security printing in dry-offset of a complete multi-color ink coating for use in printing on supports such as sheets and webs in a rotary printing press, said collect-printing unit comprising:

a plate cylinder having at least one letterpress printing plate affixed to the periphery of said plate cylinder;

a first blanket cylinder contacting said plate cylinder;

a second blanket cylinder contacting said plate cylinder and having a plurality of ink receiving blankets affixed to the periphery of said second blanket cylinder;

a plurality of sectorially cut-out rollers, each of said cut-out rollers having at least one hard cut-out ink contour plate affixed thereto, each of said ink contour plates, receiving one color of said multi-color ink coating, each of said cut-out rollers further having an inking unit coordinated thereto to supply said one color of said multi-color ink coating to said at least one ink contour plate affixed thereto, each of said plurality of cut-out rollers being in contact with each of said ink receiving blankets on said second blanket cylinder to impart said complete multi-color ink coating to each of said ink receiving blankets on said second blanket cylinder;

a first ink transfer cylinder contacting said plate cylinder, and a second ink transfer cylinder contacting both said first ink transfer cylinder and said second blanket cylinder, said plate cylinder receiving a double inking formed as a combination of partial ones of said complete multi-color ink coatings that are imparted to successive ones of said ink receiving blankets on said second blanket cylinder, said partial coatings being transferred in registry to said plate cylinder from both said first ink transfer cylinder and said second blanket cylinder, said plate cylinder transferring said complete multi-color ink coating to said first blanket cylinder; and

a counter-pressure cylinder cooperating with said first blanket cylinder so that the support to be printed is printed by being interposed between said first blanket cylinder and said counter-pressure cylinder.

4,441,424

CONTROL SYSTEM FOR CONTROLLING REGULATING MEMBERS OF PRINTING MACHINES

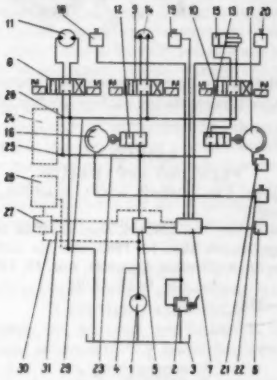
Johannes Naumann; Wolfgang Pohl, both of Coswig, and Karl-Heinz Förster, Dresden, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 405,097, Aug. 4, 1982. This application Sep. 27, 1982, Ser. No. 424,983

Claims priority, application German Democratic Rep., Aug. 4, 1981, 232359

Int. Cl.³ B41F 13/24

U.S. Cl. 101—248 7 Claims



1. A control system for a printing machine having a main shaft with a constant ratio of its rotary speed to a drive speed of the printing macnine, comprising

a plurality of translatorily, continuously rotatably and discontinuously rotatably movable regulating members controllable by a main shaft of the machine; and

a single supply system operating by hydraulic energy and associated with said regulating members, said supply system including a fixed displacement pump, an oil supply conduit connecting said fixed displacement pump with said regulating members, an electrically actuated flow regulating valve acting upon an oil stream, and a single transmitter with a signal processor arranged so that said flow regulating valve is connected with the main shaft via said signal processor.

4,441,425

PRINTING APPARATUS

Orville C. Huggins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

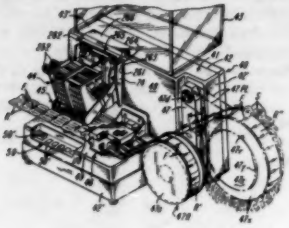
Filed Feb. 17, 1982, Ser. No. 349,498

Int. Cl.³ B41F 1/08

U.S. Cl. 101—292 16 Claims

1. Printing apparatus, comprising: a platen, a print head cooperable with the platen, means for slidably mounting the print head, means for mounting a supply roll of record material, a feed finger engageable with the record material for feeding the record material to a printing position between the print head and the platen, a slide for slidably mounting the feed finger, a single rotatably mounted cam having a single cam follower path, means driven by the cam for moving the print head into and out of printing cooperation with the platen, the print head moving means including a first cam follower and a first lever connecting the first cam follower and the print head, means driven by the cam for moving the feed finger, the feed finger moving means including a second cam follower and a second lever connecting the second cam follower and the slide, the first cam follower being in the cam follower path at a first

location, the second cam follower being in the cam follower path at a second location spaced from the first location, and



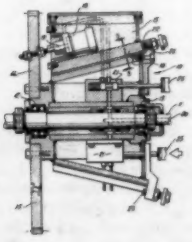
means for rotating the cam to sequentially operate the print head and the feed finger during each revolution of the cam.

4,441,426

PRINTING APPARATUS

Dusan S. Lajovic, Cnr. Victoria & O'Connell Sts., Smithfield 2164, Australia

Continuation of Ser. No. 139,265, Apr. 11, 1980, abandoned. This application Mar. 10, 1982, Ser. No. 356,301
Claims priority, application Australia, Apr. 17, 1979, PD8427
Int. Cl.³ B41F *13/08*
U.S. Cl. 101—376 **4 Claims**



1. Printing apparatus comprising:

a rotatably mounted hub having an outer periphery and a central portion, a plurality of printing blankets carried on said hub; each said blanket being mounted for separately controllable movement between an inoperative position radially inward of the outer periphery and an operative printing position at the outer periphery of said hub which is radially outward and axially offset from said inoperative position;

means for holding and moving said blankets inwardly and outwardly along a path of travel on said hub comprising a carriage for each blanket mounted within said hub at circumferentially spaced positions, a slide for each carriage extending diagonally radially and axially outwardly from the central portion of the hub toward the outer periphery thereof;

means to bias said carriages outwardly and actuate said carriages inwardly along their respective paths of travel comprising a separate fluid operated cylinder and ram assembly for each blanket carriage, a separate control valve and valve actuating means for each cylinder and a stop means on said paths to limit the travel of the carriages, defining said operative printing position;

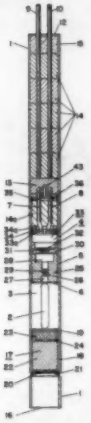
said fluid operated cylinder assemblies each having a cylinder connected to said carriage and a ram directly connected to a drive gear extending radially outwardly from said hub.

4,441,427

LIQUID DESENSITIZED, ELECTRICALLY ACTIVATED DETONATOR ASSEMBLY RESISTANT TO ACTUATION BY RADIO-FREQUENCY AND ELECTROSTATIC ENERGIES

Joseph A. F. Barrett, Collegeville, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed Mar. 1, 1982, Ser. No. 353,321
Int. Cl.³ F42B *3/18*
U.S. Cl. 102—202.6 **6 Claims**



1. An electrically activated detonator assembly for use in perforation guns which fails to detonate when immersed in liquids which comprises an elongated cylindrical outer sleeve having centrally located therein a hermetically sealed donor explosive initiator means held within a first container to propel a sheared plate in its original planar configuration through said first container longitudinally within the bore of said sleeve to strike an acceptor explosive hermetically sealed within a second container fixed at a point within said sleeve and separated from said initiator means by an open space, said outer sleeve having at least two opposing elongated vent openings located adjacent said open space having a length and a width wherein said length is at least equivalent to the distance separating said first container from said second container to provide a continuous opening in the outer sleeve between said containers, the width of said vent openings being sufficient to admit passage of liquid into and completely fill said open space when fully immersed in liquid, whereby when said assembly is electrically activated and said open space is filled with liquid neither the force of the plate striking said acceptor explosive nor the shock wave created therein is sufficient to detonate said acceptor explosive.

4,441,428

CONICAL SHAPED CHARGE LINER OF DEPLETED URANIUM

Thomas A. Wilson, 1117 N. Luna Cir., Santa Fe, N. Mex. 87501

Filed Jan. 11, 1982, Ser. No. 338,284
Int. Cl.³ F42B *1/02*
U.S. Cl. 102—307 **1 Claim**

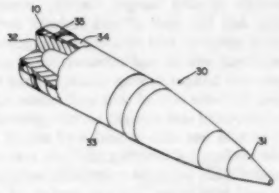
1. A shaped charge Blasting Device comprising a cylindrical charge of detonating explosive, a cavity disposed in one end of said charge, said cavity being in the shape of a cone, and a metal liner disposed in said cavity, said liner comprising depleted uranium.

4,441,429

RETAINER FOR A PROJECTILE ROTATING BAND

Abner B. Price, King George, and William S. Burnley, III, Dahlgren, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1981, Ser. No. 333,607
Int. Cl.³ F42B 31/00
U.S. Cl. 102—526 11 Claims



1. A retainer for securing a rotating band to a projectile comprising:

a first expandible split ring developing a hoop stress;

a second expandible split ring positioned inside of said first ring, said rings having limited relative movement therebetween from an orientation whereat the respective splits are positioned to allow simultaneous expansion of said rings over the projectile to be received in a groove thereon to an orientation whereat the splits are spaced apart when in the groove for applying the hoop stress developed by said first ring to oppose expansion of said second ring, said rings thereby defining a continuous single ring in the groove; and,

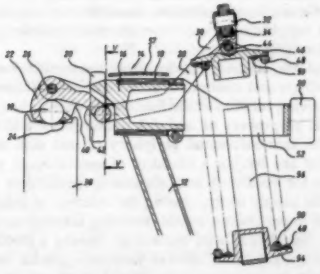
means associated with said rings for preventing the relative movement therebetween when the splits are spaced apart.

4,441,430

AERIAL MONOCABLE TRANSPORT INSTALLATION

Max Brochand, Noyarey, France, assignor to Pomagalski S.A., Fontaine, France

Filed Dec. 24, 1981, Ser. No. 334,078
Claims priority, application France, Jan. 9, 1981, 81 00432
Int. Cl.³ B61B 12/12
U.S. Cl. 104—209 1 Claim



1. An aerial monocable transport installation having a continuously operating cable, a horizontal wheel situated in the terminal station and guiding the cable around, a loading platform situated in the station along the travel path of the cable and detachable grips for clamping chairs or gondolas to the cable, each grip comprising:

an inner fixed jaw and an outer movable jaw the outer movable jaw engaging with said horizontal wheel when the grip travels around said wheel,

a spring urging the movable jaw towards the fixed jaw in a cable clamping position,

a grip body positioned when the grip is coupled on to the cable substantially horizontal and lateral on one side of the cable,

support wheels for supporting the uncoupled grip at said loading platform,

a hanger bar pivotally mounted on said grip body for supporting the chair or gondola,

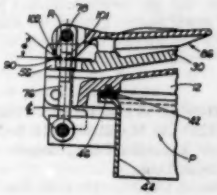
and a control mechanism including an operating shank having one end rigidly secured to the movable jaw, said shank extending substantially parallel to the grip body and carrying control means on its opposite end, said jaws when closed being substantially flush with the bottom surface of said cable and forming only limited projections on the top and on the side opposite to the grip body of said cable, said spring being disposed laterally substantially parallel to the hanger bar and acting on said opposite end of the operating shank for producing sufficient clamping force and for allowing substantial opening of the jaws, said spring being a freely disposed coil spring extending through an opening provided in the grip body at a point located between the hanger bar pivot and a support wheel secured to the end of the grip body opposite to the jaws, said coil spring being inserted between the end of the operating shank and a support bracket rigidly secured to the grip body.

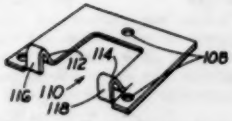
4,441,431

RAILWAY HATCH COVER AND STRAP SAFETY TAB LATCHING ASSEMBLY

John L. Carney, Jr., St. Louis, and Richard L. Gilbert, Foley, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jul. 23, 1981, Ser. No. 286,234
Int. Cl.³ B61D 17/12, 39/00; B65D 45/08
U.S. Cl. 105—377 6 Claims





1. In a hatch cover and strap assembly including a strap and hatch cover pivotably mounted upon a railway car roof in which the strap engages the cover at least at the midportion of the cover and at the distal end of the strap, an overcenter latch assembly pivotably mounted upon the car roof at a location opposite the strap pivot axis; said hatch assembly including an overcenter locking member which has at least one cam surface which in closed position engages a wear surface located on the strap, the improvement comprising: tab means formed in a removable wear plate located on said strap and preventing said handle from disengaging from said strap until pressure within said car has been relieved; wherein said tab means comprises at least one tab located adjacent, but outboard of, the cam surface on the operating handle; said tab making a sufficient angle with the horizontal and extending upwardly and outwardly from the cam surface a distance sufficient to prevent the cam portion

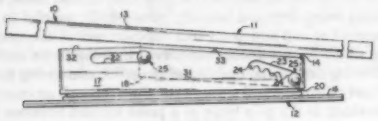
of the operating handle from moving longitudinally and disengaging from the strap until pressure within the car is dissipated, whereby the strap and cover are prevented from flying open; the outer end portion of said tab means being supported by a tab support extending vertically upwardly from a support surface below the end of the tab.

4,441,432

TILTING TABLE

Charles D. Carlton, Conway, Ark., assignor to Tiffany Industries, Inc., St. Louis, Mo.

Filed May 1, 1981, Ser. No. 259,552
Int. Cl.³ A47F 5/12
U.S. Cl. 108—5 **10 Claims**



1. A tilting table comprising:
(a) table top means,
(b) base support means for supporting the table top means,
(c) one of said means including a pair of opposed side substantially horizontal slots,
(d) one of said means including a pair of opposed side angle slots,
(e) opposed side pin means carried by the others of said means, and engaging in bearing relation the first said one means in the substantially horizontal slots and engaging in bearing relation the second said one means in the angle slots for interconnecting the table top means and for supporting the table top means,
(f) the angle slots including lower margins having a plurality of spaced notches, and
(g) said opposed side pin means including pins selectively engaging the lower margin notches for retaining the table top means in a pre-selected tilted position.

4,441,433

SHELF MOUNTING SYSTEM, PARTS THEREFOR AND METHOD OF MAKING THE SAME

Edward N. Caldwell, Knoxville, Tenn., assignor to Dalen Products, Inc., Knoxville, Tenn.

Division of Ser. No. 94,163, Nov. 14, 1979, Pat. No. 4,319,531.
This application Sep. 14, 1981, Ser. No. 301,736
Int. Cl.³ A47F 5/08
U.S. Cl. 108—152 **2 Claims**

1. In a mounting system wherein an object is mounted to one side of a wall means by at least one rigid hanger interconnected by one portion thereof to said object and having an installing portion thereof disposed in an opening of said wall means and bearing against the other side of said wall means, the improvement wherein said hanger comprises a one-piece rod-like member of a generally uniform cross-sectional configuration throughout its length and having a straight section and a curved section integrally interconnected thereto so as to define a generally J-shape, said straight section thereof being disposed in said opening and projecting generally horizontally from said one side of said wall means to define said one portion thereof and support at least part of said object thereon, said curved section being disposed adjacent said other side of said wall means in spaced relation thereto, said curved section having a substantially straight free end portion thereof disposed generally perpendicular to said straight section and engaging against said other side of said wall means in a load bearing manner, said installing portion of said hanger thereby comprising said curved section and the part of said straight section that is disposed in said opening, said opening being generally of the same cross-sectional size as said cross-sectional configuration of said hanger, said hanger having means carried thereby and bearing against said one side of said wall means adjacent said opening to tend to hold said straight section generally horizontally relative to said one side of said wall means, said object having an end surface for abutting said one side of said wall means, said end surface being interrupted by an opening means that receives said projecting straight section of said hanger therein to be supported thereby, said end surface being interrupted by recess means adjacent said opening means to receive said means of said hanger that bears against said one side of said wall means, said means of said hanger that bears against said one side of said wall comprising a pin disposed generally transverse to said straight section of said hanger, said object comprising a shelf that is disposed generally transverse to said one side of said wall means and generally horizontal, at least three said hangers being interconnected to said shelf, said wall means having three said openings passing therethrough and respectively having said straight sections of said hangers disposed therein, one of said hangers having said curved section extending generally vertically downwardly from its respective opening in said wall means to tend to resist upward pivoting movement of said shelf, the other of said hangers respectively having said curved sections extending generally vertically upwardly from their respective openings in said wall means to tend to resist downward pivoting movement of said shelf.

4,441,434

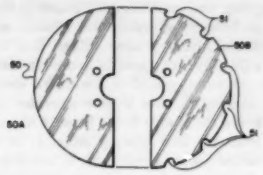
APPARATUS FOR DISPENSING PARTICULATE MATTER

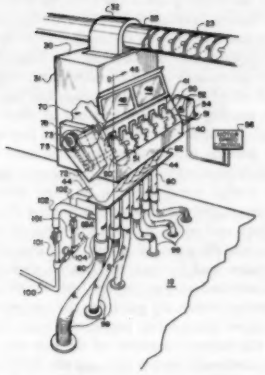
Henry R. Howard, Rte. 1, Box 203, Lancaster, S.C. 29720

Filed Oct. 26, 1981, Ser. No. 314,822
Int. Cl.³ F23K 3/00
U.S. Cl. 110—101 R **8 Claims**

1. An apparatus for dispensing and injecting solid fuel in particulate form into a combustion chamber in measured quantities and at variable rates and intermittencies, and comprising:
(a) a fuel supply source;
(b) at least one circular disk for being mounted for rotation at a uniform and continuous speed and in particulate matter receiving relation to the fuel supply source the circumferential perpiphery of said disk defining first and second arcs; the circumferential periphery of said disk defining said first arc having a plurality of spaced-apart pockets therein for receiving and dispensing particulate matter from the supply source during the interval or rotation of said arc in particulate matter receiving relation to the fuel supply source, and said second arc having a continuous, uninterrupted circumferential periphery greater than any one of the spaces between the spaced-apart pockets of said first arc for passing in particulate matter receiving relation to the fuel supply source without receiving or dispensing particulate matter therefrom, whereby fuel is received and dispensed from said supply source at rates and intermittencies corresponding to the speed of rotation of said circular disk and the volumetric capacity and spacing of the pockets around the circumferential periphery of said first arc in relation to the continuous uninterrupted circumferential periphery defined by said second arc;
(c) each said disk defining at least two mateable disk seg-

ments having complementary, non-circumferential sides, at least one of said segments having a plurality of pockets therein at spaced-apart interval around its circumferential periphery;





(d) means for rotating said at least one circular disk; and,

(e) means for dispersing said fuel after being dispensed by said at least one circular disk in a stream of air and injecting said fuel into a combustion chamber.

4,441,435

FLUIDIZING GAS CONTROL SYSTEM IN FLUIDIZED-BED INCINERATOR

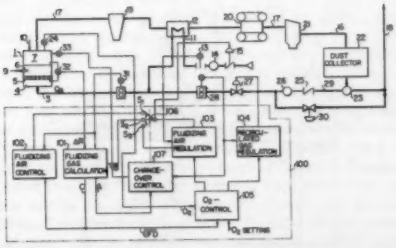
Akira Miyamoto, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,275

Claims priority, application Japan, Oct. 21, 1981, 56-167129; May 14, 1982, 57-79870

Int. Cl.³ F23G *5/00*

U.S. Cl. 110—245 **7 Claims**



1. A fluidizing gas control apparatus for a fluidized-bed incinerator comprising:

a fluidized-bed incinerator igniting an object to be incinerated under formation of a fluidized-bed of a fluid-forming medium;

fluidizing air supplying means for supplying fluidizing air furnishing oxygen required for combustion and assisting in the formation of said fluidized bed by the fluid-forming medium in said fluidized-bed incinerator;

gas recirculating means for recirculating a portion of exhaust gases discharged from said fluidized-bed incinerator;

first means for determining the optimum value of the flow rate of fluidizing gas on the basis of a variation of the pressure loss of the fluidizing air flowing across said bed formed by the fluid-forming medium, while progressively increasing the flow rate of the fluidizing air supplied by said fluidizing air supplying means to said fluidized-bed incinerator in the combustion starting stage of said fluidized-bed incinerator; and

second means for controlling said fluidizing air supplying means and said gas recirculating means so that the sum of the flow rate of the fluidizing air supplied by said fluidizing air supplying means and the flow rate of the recirculated gases recirculated by said gas recirculating means attains said optimum value of the fluidizing gas flow rate.

5. A fluidizing gas control apparatus for a fluidized-bed incinerator comprising:

a fluidized-bed incinerator igniting an object to be incinerated under formation of a fluidized bed of a fluid-forming medium;

fluidizing air supplying means for supplying fluidizing air furnishing oxygen required for combustion and assisting in the formation of said fluidized bed by the fluid-forming medium in said fluidized-bed incinerator;

gas recirculating means for recirculating a portion of exhaust gases discharged from said fluidized-bed incinerator;

means for determining the optimum value of the flow rate of fluidizing gas on the basis of a variation of the pressure loss of the fluidizing air flowing across said bed formed by the fluid-forming medium, while progressively increasing the flow rate of the fluidizing air supplied by said fluidizing air supplying means to said fluidized-bed incinerator in the combustion starting stage of said fluidized-bed incinerator in which the object to be incinerated is not still charged into said incinerator and said gas recirculating means is not placed in operation;

first means for controlling said fluidizing air supplying means so that the flow rate of the fluidizing air attains said optimum value of the fluidizing gas flow rate;

second means for controlling said fluidizing air supplying means and said gas recirculating means so that the sum of the flow rate of the fluidizing air and the flow rate of the recirculated gases attains said optimum value of the fluidizing gas flow rate; and

change-over means for enabling said second means and disenabling said first means under the normal operating condition of said apparatus, while, on the other hand, disenabling said second means and enabling said first means in the event that said gas recirculating means is disabled.

4,441,436

SOLID FUEL BURNING METHODS AND APPARATUS

Nobuhiko Hayashi, Shozuoka, Japan, assignor to Takumi Noma, Orangevale, Calif.

Filed Oct. 27, 1982, Ser. No. 437,090

Int. Cl.³ F23B *7/00*

U.S. Cl. 110—315 **15 Claims**

1. In a method of burning fuel from a supply of solid fuel positioned at one side of a grating, the improvement comprising in combination the steps of:

providing said grating as a primary grating;

increasing attainable temperature of said primary grating by providing a secondary grating spaced from said primary grating and located between said primary grating and a fire chamber;

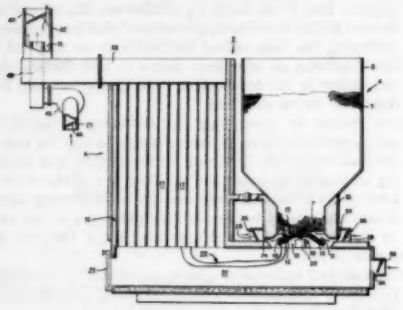
lighting a layer of said solid fuel at said primary grating to discharge combustible gas;

drawing said gas downwardly through said primary and secondary gratings to said fire chamber; and

burning said drawn gas in said fire chamber.

8. In apparatus for burning fuel from a supply of solid fuel positioned at one side of a grating, the improvement comprising in combination:

a primary grating serving as said grating;



means for increasing attainable temperature of said primary grating, including a secondary grating spaced from said primary grating and located between said primary grating and a fire chamber;

means for lighting a layer of said solid fuel at said primary grating to discharge combustible gas; and

means for drawing said gas downwardly through said primary and secondary gratings to said fire chamber for combustion in said fire chamber.

4,441,437

PROCESS FOR THERMIC TREATMENT OF SLUDGES, PARTICULARLY TREATMENT OF CLARIFICATION SLUDGES

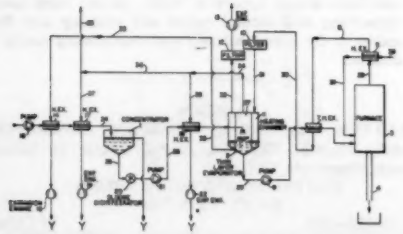
Gerhard Moskau, Saarbruecken-Dudweiler, Fed. Rep. of Germany, assignor to Saarberg-Fernwarme GmbH, Saarbrucken, Fed. Rep. of Germany

Continuation of Ser. No. 173,257, Jul. 29, 1980, abandoned, which is a continuation of Ser. No. 965,303, Dec. 1, 1978, abandoned. This application Oct. 23, 1981, Ser. No. 314,331

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1977, 2753537

Int. Cl.³ F23C 5/00; F23G 7/00

U.S. Cl. 110—346 **2 Claims**



1. An energy efficient process for thermic treatment of aqueous clarification sludge which contains oxidizable matter comprising pumping the sludge, flowing the sludge through a first heat exchanger and heating the sludge, flowing the sludge through a second heat exchanger and further heating the sludge, flowing the further heated sludge into a concentrator, settling concentrated sludge in the concentrator, removing heated water and dissolved materials from the concentrator, withdrawing concentrated sludge from the concentrator, disintegrating the concentrated sludge with a sludge disintegrator, pumping the disintegrated concentrated sludge to a higher pressure, heating the concentrated disintegrated sludge in a third heat exchanger, spraying the heated and pressurized concentrated and disintegrated sludge into a first heating chamber of a thin layer evaporator and evaporating the heated and pressurized disintegrated concentrated sludge in the first heating chamber of the thin layer evaporator, withdrawing a second portion of the sludge in the form of heated and pressurized steam from the first heating chamber of the thin layer evaporator, withdrawing a remainder of the evaporated heated pressurized concentrated and disintegrated sludge from the thin layer evaporator and increasing pressure of the remainder of the sludge with a third pump, heating the remainder of the sludge under increased pressure in a fourth heat exchanger and feeding the heated increased pressure sludge remainder to a furnace, introducing oxygen through a fifth heat exchanger, heating the oxygen and introducing the heated oxygen from the fifth heat exchanger to the furnace, removing ash from the furnace, and withdrawing a third steam and gas mixture from the furnace, passing the steam and gas mixture from the furnace through the fifth heat exchanger and heating the incoming oxygen, passing the steam and gas mixture from the fifth heat exchanger to the fourth heat exchanger and heating the pressurized sludge remainder on its way into the furnace, passing the steam and gas mixture through a filter and removing ashes, dust and sand, passing the filtered steam and gas mixture from the filter into a second heat chamber of the thin layer evaporator and heating the heated pressurized disintegrated concentrated sludge in the first chamber of the thin layer evaporator, removing gas from the second heat chamber of the thin layer evaporator, separately removing condensed steam from the second chamber of the thin layer evaporator, flowing the condensed steam through the first heat exchanger to heat the incoming aqueous sludge, flowing the steam withdrawn from the sludge in the first chamber of the thin layer evaporator through the second heat exchanger and further heating the incoming sludge, flowing the steam generated from the sludge in the first chamber of the thin layer evaporator through the third heat exchanger and heating the pressurized concentrated and disintegrated sludge.

4,441,438

APPARATUS FOR MANUFACTURING A CONTINUOUS SLIDE FASTENER STRINGER CHAIN WITH ELEMENT-FREE SPACE PORTIONS

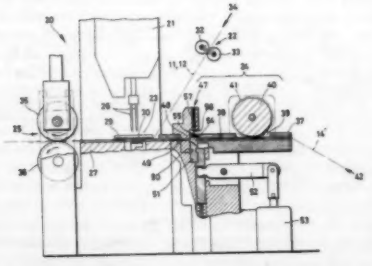
Kihei Takahashi, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 23, 1982, Ser. No. 391,003

Claims priority, application Japan, Jun. 24, 1981, 56-93320[U]

Int. Cl.³ D05C 3/12

U.S. Cl. 112—104 **5 Claims**



1. An apparatus for manufacturing a continuous slide fastener stringer chain including space portions devoid of cou-

pling elements at longitudinal intervals, the apparatus comprising:

(a) a sewing machine continuously drivable to sew a pair of interengaged rows of continuous coupling elements to a pair of continuous slide fastener stringer tapes along inner longitudinal edges, respectively;

(b) means for continuously feeding said pair of continuous slide fastener stringer tapes, in synchronism with said sewing machine, to a sewing area of said sewing machine along a first longitudinal path;

(c) a stationary guide member having a longitudinal guide channel for the passage therethrough of said pair of interengaged rows of coupling elements;

(d) a wheel having on its periphery means projecting into said guide channel for engaging and feeding said pair of interengaged rows of coupling elements, said wheel being rotatable to intermittently feed said pair of interengaged rows of coupling elements, in synchronism with said sewing machine, to said sewing area along a second longitudinal path; and

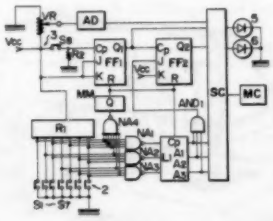
(e) a cutter assembly disposed between said sewing area and said wheel for cutting off a length of coupling elements then being sewn from said pair of rows of coupling elements each time the latter stops moving.

4,441,439

STITCH FUNCTION SWITCHING SYSTEM FOR SEWING MACHINES

Susumu Hanyu, and Hideaki Takenoya, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,236
Claims priority, application Japan, Jun. 27, 1980, 55-89370
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **6 Claims**



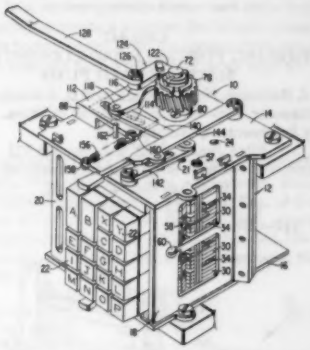
1. A stitch function switching system for a new sewing machine having a housing, a drive shaft rotatably mounted on the housing to vertically reciprocate a laterally swingable needle relative to a fabric to be sewn, a fabric feeding device operated to feed a fabric relative to the needle, a machine drive motor driven to rotate the drive shaft, an operator-controlled switch (MC) operated to normally control the rotation speed of the machine drive motor, said stitch function switching system comprising a plurality of pattern selecting switches selectively operated to select a plurality of different stitch patterns; stitch control means (SC) including an electronic memory storing stitch control data which are made effective with a selective operation of the pattern selecting switches to control the lateral swinging amplitude of the needle and the fabric feed pitch of the fabric feeding device, in dependence upon a selected pattern, said stitch control means being electrically connected to the operator-controlled switch (MC); manually operated means including a knob (3) which is rotationally operated to adjust the lateral swinging amplitude of the needle and is axially operated to change the function of the sewing machine; function switching means (S_8, FF_1, FF_2) operated in association with the axial operation of the knob (3) to produce a code signal for making effective the operation of the operator-controlled switch (MC) to control the lateral swinging amplitude of the needle.

4,441,440

PUSH-BUTTON CONTROL MODULE FOR A SEWING MACHINE

William Weisz, Tenafly, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Dec. 14, 1982, Ser. No. 449,721
Int. Cl.³ D05B *3/02, 3/04*
U.S. Cl. 112—158 C **6 Claims**



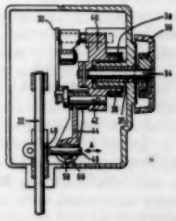
1. A control module for a sewing machine, the said module including a structural frame, multiple rows of push-buttons slidably mounted for linear motion in the frame and including rear portions extending into a single row perpendicular to the linear direction of movement of the push-buttons, a plurality of stitch controlling cams mounted for rotation in said frame, a cam follower for each such cam slidably movable in the frame into engagement with its associated cam by the rear portion of a push-button in said row and movable in the frame by the engaged cam, and stitch controlling means operable by the cam followers, the stitch controlling means including a needle bight controlling plate and a feed controlling wobble plate mounted on the frame for pivotal movement about a common axis, the needle bight controlling wobble plate being engageable by certain of the cam followers and the feed controlling plate being engageable by other cam followers.

4,441,441

NEEDLE BAR DRIVE IN SEWING MACHINES

Nerco Bianchi, Pavia, Italy, assignor to NECCHI, Pavia, Italy

Filed May 27, 1982, Ser. No. 382,554
Claims priority, application Italy, Jun. 10, 1981, 42912 A/81
Int. Cl.³ D05B *55/14*
U.S. Cl. 112—221 **1 Claim**



1. Needle bar drive in sewing machines having a front and back in which the work is fed from front to back comprising a crank provided at the end of a main shaft of the sewing machine; a needle bar block having a pin extending therefrom; a connecting rod connected at one end to the crank and at the other end to the pin of the needle bar block, said connecting rod at the other end having a fork-shaped lower portion with

a bore therethrough; a control rod provided to impart transverse movement to a needle bar relative to the work feed direction; and a connection between the needle bar and the connecting rod, said connection being a roller shaped bush rotatably mounted in the bore in the fork shaped lower portion of the connecting rod, said bush having a bore therethrough with its axis perpendicular to the axis of the bore through the connecting rod, said pin sliding inside the bore of said bush to connect the bush and the connecting rod.

4,441,442

SELF-OILING PORTABLE BAG-CLOSING SEWING MACHINE WITH PUMP

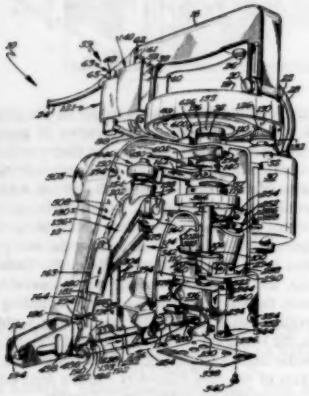
Robert J. Robinson, North Oaks; David B. Johnson, and Verdell H. Schroeder, both of Minneapolis, all of Minn., assignors to AXIA Incorporated, Oakbrook, Ill.

Filed Jun. 7, 1982, Ser. No. 385,921

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

Int. Cl.³ D05B 71/00

U.S. Cl. 112—256 **11 Claims**



1. A self-oiling portable bag-closing sewing machine energizable from a power source, and capable of using thread to stitch a bag closed comprising:

a housing having an internal drive train chamber and said housing including a handle for carrying the machine;

first and second main drive shaft bearings, each said bearing having a central axis, each being carried by said housing, said bearings being positioned substantially coaxially, and each said bearing having an inner and an outer periphery, and an upper and a lower end;

driving means selectively connectable to the power source, carried by said housing, and including a motor and a main drive shaft rotatably mounted in said first and second main drive shaft bearings for rotation about the longitudinal axis of said main drive shaft, and said main drive shaft extending within said drive train chamber and being drivingly connected with said motor to rotate said main drive shaft when the motor is energized;

a needle driving assembly including a needle having a longitudinal axis, said needle driving assembly being operatively movingly connected with said driving means to move said needle along said longitudinal axis of said needle in reciprocating movement in response to energizing of said driving means;

a feed dog assembly carried by said housing and operatively connected to said driving means to actuate said feed dog assembly for cooperation with said needle driving assembly in response to energizing of said driving means;

a presser foot unit carried by said housing and selectively bearing against said feed dog assembly and cooperating with said feed dog assembly to urge the bag against said feed dog assembly and thereby assist in moving the bag along a path past the needle;

a looper assembly carried by said housing and operatively connected with said driving means, said looper assembly cooperating with said reciprocating needle to form a stitch with the thread so as to cause the bag to be stitched closed as the bag moves along the path;

an oil reservoir capable of storing the oil and carried by said housing;

a selectively actuated pump having an inlet and outlet;

said inlet of said pump being connected in fluid flow relationship with said oil reservoir to receive oil from said reservoir; and

oil delivery means connected in fluid flow relationship with said outlet of said pump and to said housing to direct oil into said drive train chamber and into at least one of said main bearings to lubricate said bearing and to cause excess oil discharge from said bearing and onto said main drive shaft for dispersion of the oil by outward flinging from said driveshaft onto at least one of said assemblies during rotation of said driveshaft.

4,441,443

SEWING-MACHINE FRAME

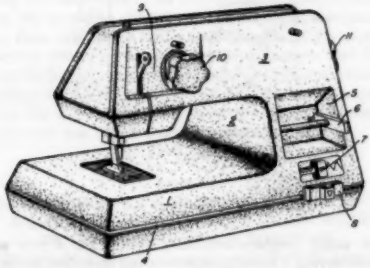
Albert Hrovatin, and Joze Brezec, both of Koper, Yugoslavia, assignors to Do-Mehanotehnika, Proizvodnja in Prodaja Igrac, Kovinskih in Plasticnih Izdelkov N.Sol.O., Izola, Yugoslavia

Filed Jun. 24, 1982, Ser. No. 391,695

Claims priority, application Yugoslavia, Dec. 25, 1981, M485/81

Int. Cl.³ D05B 73/00

U.S. Cl. 112—258 **1 Claim**



1. Sewing-machine, characterized in that the basic form of the whole body is derived from a four-sided truncated pyramid; in that a pedestal plate has a rectangular shape, its side planes being convex so that the cross-section of the convexity is shaped as an isosceles triangle with a square cutout in the top, which appears in the plate as a channel running around it; in that a pillar is embodied as a truncated four-sided pyramid which on the front side has a prismatic hollow in which is embodied a carrier of a thread reel, the carrier being shaped as a lying letter T; in that under the hollow there is embodied a smaller prismatically shaped button, thereunder being embodied a button shaped as on oblong rectangular plate with a convexity formed in the middle of the front side, the convexity having a shape of a prism in which is embodied a hollow with an outline of an equilateral triangle turned downwards; in that an overhang beam is shaped as an oblong truncated four-sided pyramid with a smaller downwards directed truncated pyramid formed on the free end on the lower side, whereby on the front side near the free end there is embodied a shallow hollow, its outline having the form of a trapezoid with rounded off angles at its lower base-line, and whereon is arranged a first

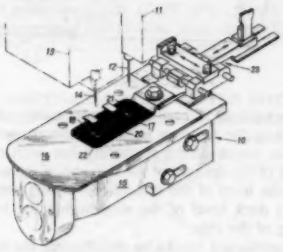
button, which has a shape of a cylinder with several coaxially running channels on the surface; in that the side planes and the upper plane of the overhang beam are concave; in that on the side plane of the overhang beam there is at the pillar arranged a second button, which has the same shape as said first button, it being, however, slightly larger; and finally characterized in that all edges and corners are rounded off.

4,441,444

ANTI-FRICTION APPARATUS FOR CLOTH FEEDPLATE

Wilhelm H. Jung, Mechanicsville, Va., assignor to AMF Inc., White Plains, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,819
Int. Cl.³ D05B *3/04*
U.S. Cl. 112—311 **8 Claims**



1. In a sewing machine having a throatplate with a needle hole and a feedplate disposed above said throatplate universally driven in accordance with a preprogrammed pattern and having an opening continuously exposing the needle hole, the improvement comprising an anti-friction means comprising

a plurality of openings in said throat plate in a spaced series around said needle hole;

a plurality of bearing and support means each disposed in close fitting relationship in a different one of said openings and extending outwardly therefrom engaging said feed plate from beneath to support same at a fixed distance above the throatplate and to provide a low friction connection beneath the throatplate and the feedplate;

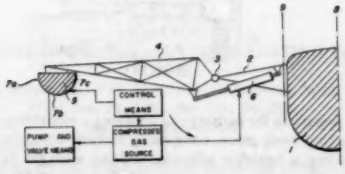
said bearing means being of a better wear resistant material having a lower coefficient of friction than said throat and feedplates.

4,441,445

SELF-RIGHTING MULTIHULL BOAT

Roger De Weck, CH-1723 Villars-sur Marly, Switzerland

Filed Nov. 17, 1981, Ser. No. 322,199
Claims priority, application Switzerland, Nov. 24, 1980, 8671/80
Int. Cl.³ B63B *35/36*
U.S. Cl. 114—39 **9 Claims**



1. A multihull boat, comprising

(a) a main body portion (1) having a normal upright position relative to a body of water;

(b) at least one side hull member (5);

(c) articulation means (3) pivotally connecting said side hull member with said main body portion for pivotal movement about a horizontal pivot axis parallel with the longitudinal axis of said main body portion, said side hull member normally having a first position at water level when said main body portion is in its upright position;

(d) means (*7a, 7b, 7c*) for filling and draining said side hull member with water; and

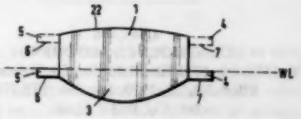
(e) means (6) for pivoting said side hull member downwardly about said articulation pivot axis relative to said main body portion when the boat is in its normal upright position to a second position below said main body portion, thereby to create a moment for inducing rotation of said main body portion about the longitudinal axis thereof after the boat has been capsized by more than 90°.

4,441,446

IMPROVEMENTS IN WINDSURFING BOARDS

Hans Fichtner, Seeshaupt, Fed. Rep. of Germany, assignor to Mistral Windsurfing AG, Nurensdorf, Fed. Rep. of Germany

Continuation of Ser. No. 221,824, Dec. 31, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,734
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 8007676
Int. Cl.³ B63B *1/22*
U.S. Cl. 114—39 **17 Claims**



1. In a windsurfing board comprising a surfboard-like hull, means for joining a sail to the hull, fin plate means with stabilizing faces on at least two sides and the stern part of said hull, and single foot operated adjusting means for adjusting the level of said fin plate means by a person on top of the hull;

wherein said fin plate means are substantially horizontal when viewed in the direction normal to a median line of said hull and form a smooth-unbroken outline with said hull; and

wherein said adjustment means has a lever extending upwardly through a portion of said hull; said adjusting means further has two limiting end positions, an upper position for placing the fin plate means above the water line in a loaded condition and a lower position for placing the fin plate means below the water line, thereby enabling the hull shape to be changed between a displacement hull and a gliding hull.

4,441,447

REMOVABLE RUDDER ASSEMBLY

Hobart L. Alter; Lewis F. Wake, both of Capistrano Beach, and Myron G. Platten, Newport Beach, all of Calif., assignors to Coast Catamaran Corporation, Oceanside, Calif.

Filed Jul. 23, 1982, Ser. No. 401,373
Int. Cl.³ B63H *25/06*
U.S. Cl. 114—167 **9 Claims**

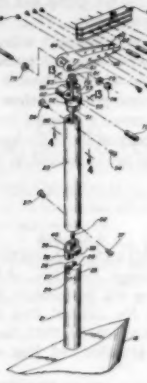
1. A removable rudder assembly for a boat comprising:

a rudder,

a first rudder shaft extending upwardly from the rudder, a second rudder shaft extending upwardly from the first rudder shaft and extending coaxially with the first rudder shaft, and

means for detachably connecting the first and second rudder shafts, the connecting means including a first connecting plug on the first rudder shaft and a second connecting

plug on the second rudder shaft, operably engaging the first connecting plug, and locking means on the first and



second connecting plugs for preventing relative rotation therebetween about the axis of the rudder shafts.

4,441,448

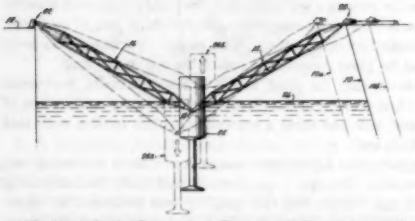
CONTROLLED MOORING

Ernest T. Hillberg, 1721 Sheffield Dr., La Habra, Calif. 90631

Filed Jul. 25, 1980, Ser. No. 172,279

Int. Cl.³ B63B *21/00*

U.S. Cl. 114—230 **25 Claims**



19. A method of towing a first vessel from a second vessel comprising

connecting a pair of pivotally interconnected compression links to and between said vessels, and

pivotally connecting a partly submerged buoy to said links between said vessels so as to cause said buoy to increase its submergence when said vessels approach one another and to cause said buoy to decrease its submergence when the distance between said vessels increases.

4,441,449

PORT RAMP FOR ACCESS TO A ROLL-ON ROLL-OFF SHIP

Jacques Biaggi, Sevres, France, assignor to MacGregor International, S.A., Basel, Switzerland

Continuation of Ser. No. 888,472, Mar. 20, 1978, abandoned. This application May 15, 1981, Ser. No. 263,891

Claims priority, application France, Mar. 22, 1977, 77 08565

Int. Cl.³ B63B *27/14*

U.S. Cl. 114—263 **5 Claims**

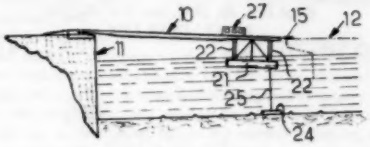
1. A method for using a port access ramp to a ship such as a roll-on roll-off ship, the method comprising:

supporting a first end of a ramp at a fixed level;

rigidly supporting the second end of the ramp from a float adjacent to a ship to provide a connecting path for loading and unloading the ship via said ramp;

anchoring the float by a line to anchoring blocks on the bottom;

ballasting or deballasting the float to achieve a buoyancy of the float at least equal to the sum of that part of the weight of the ramp which is carried by the float and a predetermined maximum useful load of the ramp, so that the said float exerts on the anchoring line a tension force at least equal to said maximum predetermined useful load of the ramp, whereby the height of the second end of said ramp



above the surface of the water is independent of the load supported by the ramp up to said maximum useful load;

adjusting the length of the anchoring line with respect to variations of the draught of the ship and of the water level to allow the level of the second end of the ramp to conform to a deck level of the ship during the loading or unloading of the ship;

raising the anchoring blocks by deballasting the float to its maximum buoyancy; and

pivoting the ramp about a vertical axis at the first end of the ramp to move the second end of the ramp from one location to another.

4,441,450

APPARATUS FOR MELTING AND APPLYING A MELTABLE ADHESIVE

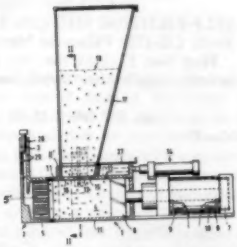
Alfred Dettelbach, Stuttgart, and Roland Henzler, Nuertingen-Raidwangen, both of Fed. Rep. of Germany, assignors to Reich Spezialmaschinen GmbH, Nuertingen, Fed. Rep. of Germany

Filed Mar. 2, 1982, Ser. No. 353,962

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109369

Int. Cl.³ B05C *5/02*

U.S. Cl. 118—681 **11 Claims**



1. An apparatus for melting and applying a meltable granular adhesive to a work piece, comprising melting chamber means **(4)** including a heatable adhesive melting wall **(5)** provided with adhesive discharge openings **(5')**, first power driven feed advance piston drive means **(6)** slidably supported in said melting chamber means **(4)** for discharging melted adhesive through said openings **(5')** in response to movement of a work piece, an adhesive inlet port **(12)** in a port wall of said melting chamber means **(4)**, adhesive supply container means **(17)** having an outlet operatively connectable to said inlet port **(12)**, closure slide means **(13)** operatively arranged for sliding rela-

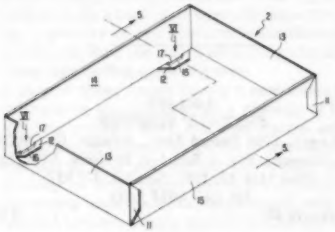
tive to said port wall for simultaneously closing or opening said inlet port (12) and said outlet of said supply container means, and second separate power driven piston drive means (14) operatively connected to said closure slide means (13) for power operating said closure slide means for supplying meltable adhesive into said melting chamber means (4) and for closing off the melting chamber means (4) from the supply container means (17), and control means operatively connected to said first and second driven piston drive means (6 and 14) for operating said slide means (13) separately of and prior to operation of said first feed advance piston drive means (6) so that said closing of the opening (12) and of the outlet of the supply container (17) is completed before the feed advance piston means (6) begins to move in a feed advance direction, said control means comprising limit switch means (9) operatively arranged for actuation by said power driven feed advance piston drive means (6), said limit switch means (9) controlling said second separate piston drive means (14) for the opening movement of said closure slide means (13).

4,441,451

DISPOSABLE KITTY LITTER BOX

Dennis E. Neal, 5322 O'Shea La., Stone Mountain, Ga. 30088

Filed Mar. 17, 1982, Ser. No. 359,056
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—1 **4 Claims**



1. A disposable kitty litter box comprising:

a. a box bottom having its inside completely sealed against moisture by its bottom and side walls, and

b. a box top being sized such that the box bottom will fit inside the box top whenever said box top is turned upside down;

said box bottom has two sets of opposite side walls, one set of which has three moisture barriers, one of the barriers having first attachment means, communicating with second attachment means on another of the barriers, for holding the three moisture barriers in alignment while the box bottom is maintained completely sealed;

whereby said box top in its upside down position serves as an additional moisture barrier for the bottom and side walls of the box bottom.

4,441,452

METHOD AND APPARATUS FOR AERATING FISH PONDS

Ernest D. Strain, Jr., P.O. Box 1578, Greenwood, Miss. 38930

Filed Jan. 21, 1982, Ser. No. 341,308
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—3 **6 Claims**

1. A portable fish pond aeration apparatus comprising, in combination,

pump means including a pump housing having a pump inlet and a pump outlet and impeller means mounted for rotation about a fixed axis within the housing,

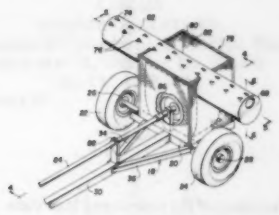
drive means for rotating said impeller means to draw water into the pump inlet and discharge the water from the pump outlet,

manifold means connected to said housing to receive water discharged from said outlet, said manifold means including an elongated pipe rigidly mounted at a location above said pump inlet,

closure means mounted on each end of said elongated pipe,

a pair of primary discharge openings formed one in each said closure means for discharging water from the manifold, said primary discharge openings being arranged to discharge water in generally colinear, oppositely directed streams,

a single axle trailer adapted to be towed along the ground by a tractor, said trailer including a frame supporting said pump means and said manifold means, wheel means mounting said frame for movement over the ground, and connecting means for connecting said frame to a tractor



for towing, said connecting means including an elongated tongue having one end connected to said frame and projecting forwardly therefrom and having its other end adapted to be connected to the drawbar of a tractor for towing,

said manifold means having its longitudinal axis extending generally parallel to the single axis of said trailer,

said pump means being operable when positioned in a pond of water adjacent the shoreline with the pump inlet below the water level to discharge said generally colinear streams generally parallel to the shoreline of the pond to aerate the water and to drive fish from the shallow water adjacent the shoreline of the pond in both directions from the pump.

4,441,453

ARTIFICIAL FISH HABITAT

Robert L. McMickle, and Danny R. Foote, both of Spirit Lake, Iowa, assignors to Berkley and Company, Inc., Spirit Lake, Iowa

Filed Feb. 10, 1982, Ser. No. 347,523
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—3 **7 Claims**

1. An artificial fish habitat located in a natural body of water, such as a lake, having a bottom which is irregular so that the body of water is of variable depth, said habitat comprising:

a plurality of separate self-weighted non-corrosive anchor members dropped in the body of water at spaced points;

a plurality of buoyant water impervious strands for each of the anchor members, said strands having a density of from 0.4 to 0.97 gms/cm^3 and having a length of between a few inches and 30 feet or more depending upon the depth of the body of water in which they are to be placed;

means for connecting said strands to the associated anchor member; and

each anchor member having sufficient mass to remain on the bottom at the area at which it has been dropped despite

the buoyancy of the strands and regardless of the depth of the water at which it is placed.

4,441,454

MILKING APPARATUS

Fritz Happel, 8951 Baisweil 24, and Werner Happel, both of Baisweil, Fed. Rep. of Germany, assignors to Fritz Happel, Baisweil, Fed. Rep. of Germany

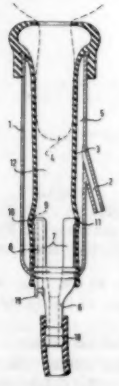
PCT No. PCT/EP81/00058, 371 Date Jan. 27, 1982, 102(e) Date Jan. 27, 1982, PCT Pub. No. WO81/03412, PCT Pub. Date Dec. 10, 1981

PCT Filed May 27, 1981, Ser. No. 346,033

Claims priority, application Fed. Rep. of Germany, May 28, 1980, 3020294; Jun. 16, 1980, 3022555

Int. Cl.³ A01J *5/04, 5/08*

U.S. Cl. 119—14.36 **14 Claims**



14. Milking apparatus comprising a collection chamber; a connection for connecting said collection chamber to a vacuum source; four two-chamber milking cups each including a respective teat rubber, each said teat rubber having a wall, and defining, within the associated milking cup, an inner chamber including a teat reception zone and an intermediate chamber means for subjecting said intermediate chambers to periodically varying pressures to generate suction and massage phases; respective short milk lines for connecting said milking cups to mutually displaced collection chamber connections leading to respective openings into said collection chamber; each said milking cup further including a valve unit actuated in dependence on the pressure differences which occur in the suction and massage pulses to connect the inner chamber of the milking cup and the associated milk line to atmosphere during the massage phase; wherein each said valve unit is disposed within the associated teat rubber beneath the teat reception zone and is changed over between the closed and opened conditions by the wall of the teat rubber which moves in dependence on the pressure difference; wherein each said valve unit comprises movable and stationary parts, said movable part element being formed by a part of the wall of the teat rubber and said stationary part being formed by an insert, which extends from the lower end of the respective milking cup into the teat rubber inner chamber, each said insert having a passage which opens at one end to the atmosphere and at the other end faces the inner wall of the associated teat rubber, wherein said insert lightly spreads the teat rubber in the direction of an axial plane which extends at least substantially through the opening of the passage, whereby said wall part of said teat rubber closes said passage opening during said suction phase but frees said opening for the flow of air therethrough as said teat rubber collapses during said massage phase and wherein a removable filter is provided in the atmosphere end of the passage.

4,441,455

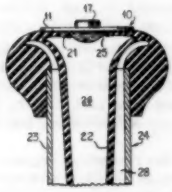
TEAT CUP STOPPER

Gary H. Lowry, 2700 Buford Hwy., Atlanta, Ga. 30324, and John A. Simmons, Rte. 4, Box 144, Pontotoc, Miss. 38863

Filed May 13, 1982, Ser. No. 377,957

Int. Cl.³ A01J *5/00*

U.S. Cl. 119—14.47 **9 Claims**



1. A closure for an unused teat cup of the type wherein a resilient liner with an outer lip is mounted within a hard outer shell of generally cylindrical shape proximate the lip and wherein the liner and said lip have a central passageway and an opening, respectively, which communicate with each other, comprising:

(a) a disk of sufficient area to cover the opening; and

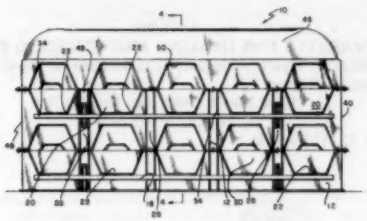
(b) a downwardly tapering projection which is rigidly attached to the disk with the positions of the disk and of the projection being fixed with respect to each other, the projection being adapted to extend over the edge of the lip and into the central passageway of the liner when the disk is in position to cover the opening thereto, the greatest dimension of the opening and of a cross-section of the projection which is disposed generally parallel to the disk being generally equal so that said projection is not distorted upon insertion into said opening, said cross section thereby preventing the closure from slipping off the lip once the projection is positioned within the opening, so that a vacuum can be held within the passageway, facilitating the use of other teat cups fluidly connected thereto during a milking operation.

4,441,456

ROLL OUT NEST SYSTEM AND METHOD

Daniel J. Scheer, Goddard, Kans., assignor to Pawnee Products,Inc., Goddard, Kans.

Filed Sep. 20, 1982, Ser. No. 420,094
Int. Cl.³ A01K *31/14*
U.S. Cl. 119—45 R **2 Claims**



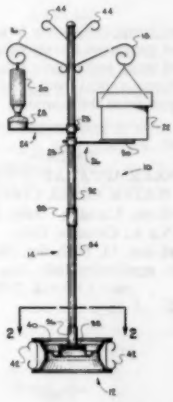
1. A roll out nest system comprising a support frame means;
at least one integral tray means supported by said frame means and contoured to define individual nesting areas for a hen and individual egg nesting-gathering areas;
at least one integral back plate means separating each individual nesting area from each individual egg nesting-gathering area, each back plate means having a structure defining a plurality of egg apertures wherethrough the eggs gravity roll from the individual nesting area into the individual egg nesting-gathering area;
said support frame means having a base frame including a structure on one side defining a plurality of base flanges and base concave slots, said base flanges and said base concave slots, in order stated are in alternating sequence, and said at least one integral tray means comprising a plurality of tray flanges and concave nesting areas in alternating sequence in the order stated, said tray flange and said concave nesting areas of at least one integral tray register and mate with the base flanges and base concave slots respectively of the base frame and are supported by the same, and said support frame means additionally having at least one centerbrace frame having a structure on each of the two sides defining a plurality of centerbrace flanges and centerbrace concave slots, said centerbrace flanges and said centerbrace concave slots on one side of the centerbrace frame are in direct opposed relationship with the centerbrace flanges and the centerbrace concave slots of the other side of the same and are in alternating sequence in the order stated, said centerbrace flanges on one side of the at least one centerbrace frame mate with and connect to the base flanges of the base frame and sandwiches therebetween said tray flanges to stationarily attach the at least one tray means thereto, the available centerbrace flanges and centerbrace concave slots being opposed to centerbrace flanges and centerbrace concave slots attached to the base frame respectively providing support for the tray flanges and concave nesting area of another integral tray, the top of said back plate means additionally providing support for another integral tray imposed over a lower integral tray such that the underneath side of a concave nesting area of the top integral tray defines a roof for a concave nesting area of the lower integral tray;
at least one pair of end plates interconnecting the flanged sides of at least one integral tray means with the flanged sides of at least one other integral tray imposed over the lower integral tray to also provide support for the upper integral tray by the lower integral tray, the top integral tray imposed over at least one lower integral tray and over at least one centerbrace frame and over at least one pair of end plates comprises a plurality of egg hole plates having an egg hole opening, said egg hole plates individually separating individual concave nesting areas from the individual egg nesting-gathering areas while providing the egg hole opening through which the eggs gravity roll from the nesting area into the egg nesting-gathering area;
and a roof member having a structure defining a plurality of roof flanges and roof concave openings, said roof flanges and said roof concave openings, in order stated, are in alternating sequence, said roof flanges respectively mating with the centerbrace flange of the centerbrace frame supporting the top integral tray in order to sandwich therebetween said top integral tray and to secure same, and said roof concave openings and said centerbrace concave slots define and provide an arc overhead entrance for the hens to facilitate entrance into the nesting areas.

4,441,457

BIRD FEEDER STAND

Doyle M. Sanford, 867 Broadmoor St., El Paso, Tex. 79912

Filed May 21, 1982, Ser. No. 380,332
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—51 R **2 Claims**



1. A bird feeder stand which supports various types of feeders comprising:
a base member fabricated from an automobile wheel rim having a bowl-shaped top portion and a center opening therethrough;
a vertically and concentrically positioned support post with a sealing plate means attachable to the lower end thereof, the sealing plate means being attachable to the base member so as to seal the center opening and form a watertight top portion for retention of water; and
support arms attached to the support post extending outwardly therefrom adapted for cantilever support of hanging type bird feeders and watering devices.

4,441,458

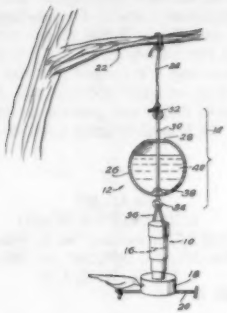
BIRD FEEDER CONSTRUCTION

Robert A. Mercil, Star Rte., Box 315, Wetmore, Mich. 49895

Continuation-in-part of Ser. No. 218,543, Dec. 22, 1980, abandoned. This application Aug. 12, 1982, Ser. No. 407,347
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—51 R **3 Claims**

1. In a hummingbird feeder construction including a bird feeder and a bail thereabove for securing it to an overhead support, the improvement comprising,
a cup-shaped container containing a liquid, having a top opening of reduced transverse dimensions relative to the main portion of the container,
a supporting element extending through the bottom wall of

the container, and having means at its upper end for connection with a supporting means and means at its lower end for connection with said bail, and the supporting element being thereby operable, to the exclusion of the container, for entirely supporting the feeder,



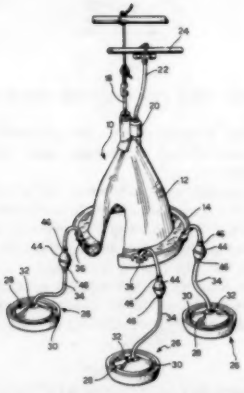
the top opening being sufficiently large to prevent ants from reaching the margin of the opening from the supporting element, and being sufficiently small to prevent a bird as small as a hummingbird from reaching therethrough and drinking liquid from the container.

4,441,459

CHICK DRINKER APPARATUS WITH AUTOMATIC WATER LEVEL CONTROL

Sebastiano Giordano, Caraglio, Italy, assignor to Giordano Poultry-Plast S.p.A., Caraglio, Italy

Filed Jun. 14, 1982, Ser. No. 388,364
Claims priority, application Italy, Jun. 22, 1981, 67860 A/81
Int. Cl.³ A01K *7/00*
U.S. Cl. 119—72 **1 Claim**



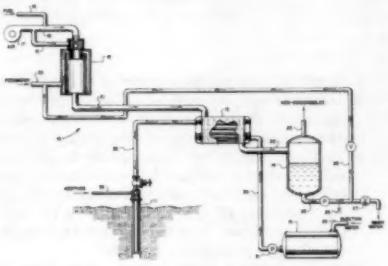
1. A poultry drinking apparatus comprising a main drinking apparatus in the form of a bell-shaped member having an annular channel at the bottom thereof for holding the supply of drinking water, automatic water level control means for controlling the water level in said annular channel, means for supporting said main drinking apparatus above ground level at a height suitable for mature poultry, a plurality of chick drinkers each having an annular channel for holding a supply of drinking water, automatic water level control means for controlling the water level in the channels of said chick drinkers, flexible siphon tubes each connecting a respective chick drinker to said main drinking apparatus, detachable means for connecting one end of each flexible siphon tube to said main drinking apparatus with said one end being disposed below the water level in the annular channel of said main drinking apparatus and hand operated priming means associated with each tube for initiating transfer of water to said chick drinkers with the automatic water level control means associated with said chick drinkers limiting the amount of water being transferred.

4,441,460

APPARATUS FOR HEATING AND UTILIZING FLUIDS

William G. Wyatt, Arlington, Tex., assignor to Vapor Energy, Inc., Arlington, Tex.

Filed May 8, 1981, Ser. No. 261,702
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—31 R **7 Claims**



1. Apparatus for providing a hot water flood to a reservoir comprising:

means for generating a low pressure stream of steam and non-condensibles by combusting a flowing fuel/air mixture in the presence of a stream of feedwater;

pump means for delivering a stream of relatively cool water at high pressure from a source thereof;

a heat exchanger for effecting heat exchange between said low pressure stream of steam and non-condensibles and said stream of cool high pressure water to heat the water stream to a desired temperature without substantially reducing the pressure thereon, while condensing at least some of the steam from said stream of steam and non-condensibles; and

means for delivering said stream of heated high pressure water from said heat exchanger into the bore of a well communicating with said reservoir.

4,441,461

ALCOHOL DISSOCIATION AND WASTE HEAT RECOVERY PROCESS FOR AUTOMOBILES

Heeyoung Yoon, and Gerald D. Rutledge, both of McMurray, Pa., assignors to Conoco Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 414,984, Sep. 3, 1982, Pat. No. 4,425,876. This application Sep. 15, 1983, Ser. No. 532,257
Int. Cl.³ F02M *27/02*
U.S. Cl. 123—3 **3 Claims**

1. A method of fuel treatment and distribution for an automobile internal combustion engine comprising the steps as follows:

(a) vaporizing liquid alcohol to form alcohol vapor;

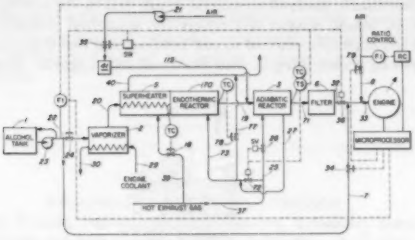
(b) providing a substantial amount of engine exhaust heat to an endothermic reactor having an endothermic dissociation catalyst therein,

(c) contacting said vapor and said endothermic dissociation catalyst for form a hydrogen-rich gaseous-vapor mixture,

(d) mixing said hydrogen-rich gaseous-vapor mixture with air to form a partial combustion mixture,

(e) operating an adiabatic reactor without a substantial amount of exhaust heat within an operational temperature

range, said adiabatic reactor having a catalyst bed comprising a partial combustion catalyst and a dissociation catalyst,



(f) contacting said partial combustion mixture and said partial combustion catalyst and said dissociation catalyst whereby a fuel mixture is formed.

4,441,462

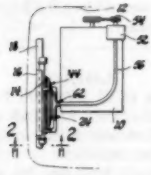
HYBRID MECHANICAL AND ELECTRICAL DRIVE AND ENGINE COOLING FAN ARRANGEMENT

John A. Budinski, Jamestown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 28, 1982, Ser. No. 402,751

Int. Cl.³ F01P *5/04*

U.S. Cl. 123—41.11 **4 Claims**



1. An automotive engine cooling fan and drive assembly for maintaining airflow through a radiator in which coolant from an associated internal combustion engine is circulated comprising a support, primary motor means comprising an electric motor mounted on said support having a rotatable output, a bladed fan directly supported by said output and directly rotatably driven thereby for inducing the flow of air through said radiator, auxiliary fan drive means having an output drivingly connected to said bladed fan for the rotatable drive thereof, control means interposed in said auxiliary drive means establishing a first condition of operation in which said primary motor means powers said fan and a second condition of operation in which said auxiliary fan drive powers said fan.

4,441,463

CONTAINER FOR FLUIDS FOR OPERATING FUNCTIONS IN MOTOR VEHICLES

Heinz Rest, and Martin Ufrecht, both of Cologne, Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

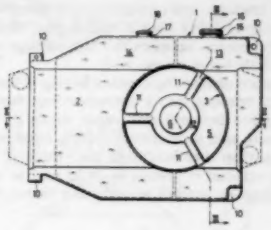
Filed Mar. 14, 1983, Ser. No. 475,005

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210260

Int. Cl.³ F01P *3/18*

U.S. Cl. 123—41.27 **11 Claims**

1. A container for fluids for use in various operating functions in motor vehicles, such as for containing windshield washer fluid and engine coolant, the container being arranged in the engine compartment of the motor vehicle and having an outer contour adapted for attachment in an operative position to the radiator, characterized by an essentially hollow annular body having an inner contour forming an annular air guide surface defining an air guide duct for an air cooling fan for an



internal combustion engine cooperating therewith, and having the outer contour shaped to the contour of the radiator with which it is associated.

4,441,464

INTAKE SYSTEM OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

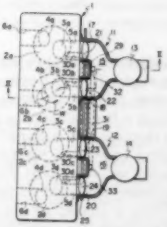
Shuhei Toyoda, and Toshio Tanahashi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 35,390, May 2, 1979, abandoned. This application Sep. 8, 1981, Ser. No. 300,049

Claims priority, application Japan, Aug. 10, 1978, 53-97607

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—52 MB **11 Claims**



1. A multi-cylinder internal combustion engine having a plurality of cylinders, each having a combustion chamber and an intake valve which has a valve head, said engine comprising:

at least two mixture passages, each mixture passage being common to at least two cylinders and comprising a collecting portion having an inlet, and at least two branch mixture passages branched off from said collecting portion of each mixture passage, each of said branch mixture passages being connected to a respective combustion chamber via a corresponding one of said intake valves;

fuel supply means arranged in an intake passage connected to the inlet of each of said collecting portions for delivering a metered flow of fuel from a fuel passage opening into the intake passage;

a common connecting channel;

at least four channel branches, each channel branch being connected to said common connecting channel and having an opening which opens into a corresponding one of said branch mixture passages, said common connecting channel opening only into said channel branches, and said channel branches opening only into said corresponding branch mixture passages, such that said branch mixture

passages are continuously interconnected via said channel branches and common connecting channel;

throttle valve means arranged in said branch mixture passages at a position upstream of the openings of said channel branches and opened in accordance with an increase in the level of the load of said engine, there being no other valve means between the fuel passage openings and said throttle valve means, and;

a separate connecting conduit having at least two ports, each port opening into a corresponding mixture passage at a location between said valve means and said fuel supply means, said separate connecting conduit having no openings other than said ports, such that said separate connecting conduit is always open to said at least two mixture passages upstream of said valve means via said ports.

4,441,465

LASH ADJUSTER OIL-SUPPLYING DEVICE

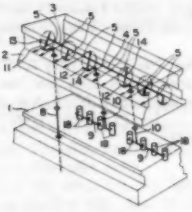
Yukio Nakamura, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 12, 1981, Ser. No. 320,565

Claims priority, application Japan, Jun. 30, 1981, 56-101979

Int. Cl.³ F01M *1/06*

U.S. Cl. 123—90.34 **11 Claims**



1. A lash adjuster oil-supplying device for an overhead camshaft-type engine having a cylinder head, a camshaft and a camshaft housing, said device comprising:

means defining a first oil passage extending from said cylinder head through said camshaft housing to said camshaft;

means defining an oil path within said camshaft;

means defining an oil jet hole formed in said camshaft and communicating with said oil path;

means defining a second oil passage extending from said camshaft through said camshaft housing; and

means defining a third oil passage, disposed in said cylinder head and extending from said second oil passage, for supplying oil to lash adjusters, wherein oil passes from said first oil passage, to said oil path, to said second oil passage, and finally to said third oil passage, a part of the oil flowing along said oil path being ejected through said oil jet hole.

4,441,466

ENERGY ACCUMULATOR AND INTERNAL-COMBUSTION ENGINE STARTER COMPRISING SAID ACCUMULATOR

Giorgio Tangorra, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

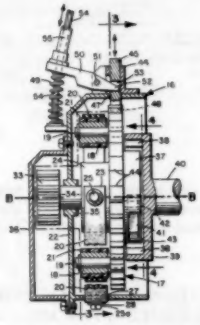
Filed Mar. 25, 1982, Ser. No. 361,759

Claims priority, application Italy, Mar. 31, 1981, 20828 A/81

Int. Cl.³ F02N *5/00*; F03G *1/04*

U.S. Cl. 123—179 S **7 Claims**

1. An apparatus for generating, storing and releasing mechanical energy for actuation of the shaft of an engine, said apparatus comprising a flat type accumulator, a first device for transferring power to the said accumulator, a second device for transferring the energy to the shaft of the engine, said accumulator comprising a ratchet wheel, a central hub, a plurality of rollers rotatably mounted on pins and circumferentially spaced on the wheel to form an open structure around said hub, a housing mounted coaxially with respect to the wheel, said wheel closing one end of said housing, a strip of elastomeric material connected at one end to the said central hub, wound around said rollers and supported thereby, and fixed at its opposite end to said housing; said first device comprising a shaft integral with the wheel and supported through



a bearing in said housing, a first gear integral with said shaft, a second gear for meshing with said first gear, said two gears being located in a crank-case outside of said housing; said second device comprising a disk integral with said wheel on the side of the wheel opposite to the rollers, a cylindrical sleeve integral with said engine shaft, and means for connecting said disk and said sleeve when the wheel rotates in a predetermined sense of rotation.

4,441,467

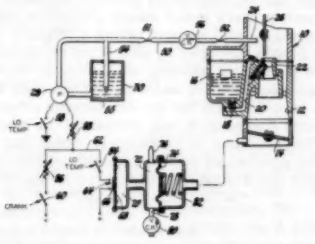
SUPPLEMENTARY FUEL SYSTEM FOR ENHANCING LOW TEMPERATURE ENGINE OPERATION

Thomas M. Powell, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 23, 1982, Ser. No. 401,076

Int. Cl.³ F02N *9/00*; F02M *7/00*

U.S. Cl. 123—179 G **4 Claims**



4. A supplementary fuel system for an engine having an induction passage for air flow to the engine, a throttle in said induction passage, and a primary fuel system adapted to deliver a low volatility fuel to the engine, said supplementary fuel system comprising a gasoline tank, a supplemental fuel line for delivering fuel into said induction passage, an electrically actuated pump for delivering gasoline from said tank through said line, said line having a restriction limiting gasoline delivery therethrough and a check valve preventing aspiration of gasoline therethrough and a drain for discharging excess gasoline from said line into said tank below the surface of the gasoline therein, means for operating said pump in response to cranking of the engine at temperatures below a certain level to thereby provide fuel which vaporizes sufficiently to enable

starting of the engine, means for operating said pump in response to a rapid increase in the pressure in said induction passage downstream of said throttle at temperatures below a predetermined level less than said certain level, to thereby provide fuel which vaporizes sufficiently to enable acceleration of the engine, and means for reducing the gasoline delivery through said line as the engine operating temperature increases.

4,441,468

SECONDARY AIR SUPPLY SYSTEM

Kenji Yoneda, Fujisawa; Fumio Sanezawa, Yokosuka; Yasuo Takagi, and Yuji Ushijima, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

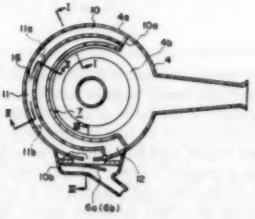
Continuation of Ser. No. 46,310, Jun. 7, 1979, abandoned. This application Sep. 2, 1981, Ser. No. 298,623

Claims priority, application Japan, Jun. 16, 1978, 53-72848

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ F02B *75/10*

U.S. Cl. 123—198 E **3 Claims**



1. A secondary air supply system for use with an internal combustion engine having an exhaust system, comprising:

an air filter casing for operatively positioning an intake air filter;

a reed valve, operative in response to exhaust pressure pulsations generated in the exhaust system of the engine to induct secondary air therethrough to the exhaust system;

means defining an air induction passage inside said engine air filter casing, said air induction passage being in communication with said reed valve so that air is inducted through said air induction passage into the exhaust system upon opening of said reed valve, said air induction passage comprising a first silencer means for attenuating exhaust noise in medium and high frequency ranges;

means defining a resonance chamber inside said air filter casing, said resonance chamber comprising a second silencer means for attenuating exhaust noises in a low frequency range;

means defining a communication passage through which said resonance chamber is in direct communication with said air induction passage, said communication passage being located inside said air filter casing;

wherein said means defining said resonance chamber comprises a first integrally formed member, and said means defining said air induction passage and communication passage comprises a second integrally formed member, said first and second integrally formed members being sealingly connectable to form a silencer assembly which is detachably disposed inside of and along an inner wall surface of said air filter casing, said second integrally formed member having an air outlet, open to said reed valve, to admit air from said air induction passage into the exhaust system of the engine through said reed valve.

4,441,469

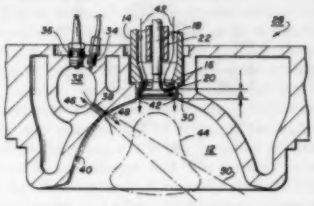
STRATIFIED FUEL INJECTION FOR GASEOUS FUEL INTERNAL COMBUSTION ENGINE

Charles F. Wilke, Allegany, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 23, 1981, Ser. No. 323,786

Int. Cl.³ F02B *3/02*

U.S. Cl. 123—295 **11 Claims**



1. In a two cycle internal combustion engine having at least one power cylinder and a head secured in position opposite said cylinder defining a main combustion chamber relative to the power cylinder thereat, the combination of:

(a) at least one antechamber defined in said head at a location displaced from said main combustion chamber;

(b) orifice means defining a flow passage between said main combustion chamber and said at least one antechamber, said orifice means being sized to pass controlled quantities of air for combustion from said main combustion chamber to said at least one antechamber during the compression stroke of the engine and to provide controlled flame projection outward from said at least one antechamber into an air-fuel mixture in said main combustion chamber after an air-fuel mixture in said at least one antechamber has been ignited;

(c) gas injection means for injecting gaseous fuel separately into each of said main combustion chamber and said at lest one antechamber in timed relation to each other, said gas injection means being operative before the compression stroke of the engine to inject fuel into said main combustion chamber in a substantially concentrated mass distribution stratified therein at a location displaced from said orifice means and operative after the compression stroke of the engine to inject fuel into said at least one antechamber to effect a combustible air-fuel mixture therein; and

(d) spark ignition means associated in ignition relation with the combustible air-fuel mixture in said at least one antechamber and operative when energized to precipitate the expansion stroke of the engine.

4,441,470

DEVICE FOR USE WITH THE INTAKE MANIFOLD OF AN INTERNAL COMBUSTION ENGINE

John Brophy, Yonkers, N.Y., assignor to Cos Cob Research Associates, Cos Cob, Conn.

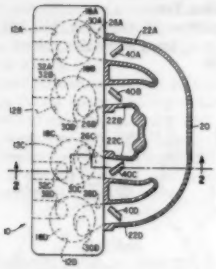
Filed Feb. 1, 1982, Ser. No. 344,317

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—306 **7 Claims**

1. An internal combustion engine having a plurality of cylinders and an intake manifold including manifold branches for passing combustion air to each of the cylinders through an associated intake port and associated intake valve, wherein said associated intake port and a respective one of said manifold branches forms a passageway the improvement comprising a tube positioned diagonally in each passageway for the combustion air to the associated intake valve, each said tube being spaced from its associated intake valve, each said tube having a diameter substantially less than that of each manifold branch

in which such tube is located and being angularly disposed so as to direct a portion of the combustion air flowing in each of



the manifold branches through such tube away from the intake valve.

4,441,471

APPARATUS FOR REGULATING THE IDLING RPM OF INTERNAL COMBUSTION ENGINES

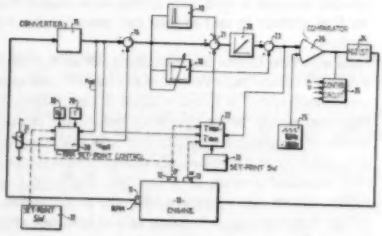
Alfred Kratt, Trossingen; Bernd Kraus, Gerlingen, and Günther Plapp, Filderstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 313,074

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039435

Int. Cl.³ F02D 11/10

U.S. Cl. 123—339 10 Claims



1. An apparatus for regulating the idling rpm of internal combustion engines whose rpm is controlled by a throttle means disposed in the intake tube, comprising:

an electromagnetically actuatable adjustment member for establishing the aspirated air quantity in the idling position of said throttle means,

means providing an actual rpm value,

means providing a desired idling rpm value,

means at least temperature responsive providing an rpm set-point value dependent on said desired idling rpm value and said actual rpm value, wherein said rpm set-point value is selected in accordance with said actual rpm value whenever an rpm threshold of approximately 100 revolutions per minute above a stationary set-point value has been attained, and the retraction of the normal value occurs in accordance with a selectable function,

a comparison means for said set-point rpm and actual rpm values, and

a subsequent regulator means connected to the output of said comparison means including means for processing at least one of proportional, integral, and differential functions of said output of said comparison means for controlling said adjustment member.

4,441,472

CHARGE-PRESSURE-DEPENDENT CONTROL APPARATUS FOR SUPERCHARGED FUEL-INJECTION ENGINES, IN PARTICULAR FOR DIESEL MOTOR VEHICLE ENGINES

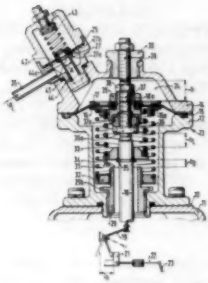
Peter Knorreck, Weissach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 3, 1982, Ser. No. 404,806

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137145

Int. Cl.³ F02D 1/04

U.S. Cl. 123—383 7 Claims



1. A charge-pressure-dependent control apparatus for supercharged fuel injected diesel engines having a movable wall displaceable counter to the force of at least one first restoring spring in accordance with charge air pressure (P_L) in an air inlet tube of said engine, said movable wall arranged to control the stroke of an adjusting member which varies the adjusting range as well as the full-load position of a supply quantity adjusting member of a fuel injection pump, said apparatus further including a pressure chamber connected via a charge air line to said air inlet tube and defined by said movable wall, further wherein the stroke of said adjusting member is defined by a first adjustable end stop when said engine is shut off and/or is operating at idling rp m (n_L) and is defined by a second adjustable end stop at maximum charge air pressure (P_{Lmax}), characterized in that said stroke of said adjusting member is enlarged to a total stroke (h) comprising a damping stroke (h_D) which precedes an adjusting stroke (h_L) controlled solely in accordance with charge pressure, said damping stroke having a stroke/time characteristic which is determined by means of a throttling device inserted into a line connection from said charge air line to said pressure chamber, said device being switched off when said charge pressure is increasing, whereby the charge pressure flows undamped into said pressure chamber to act on said movable wall.

4,441,473

CLOSED LOOP MIXTURE CONTROL USING LEARNING DATA RESETTABLE FOR FUEL EVAPORATION COMPENSATION

Shigenori Isomura; Katsuhiko Kodama, both of Kariya; Toshio Kondo, Anjyo, and Akio Kobayashi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 13, 1981, Ser. No. 243,514

Claims priority, application Japan, Mar. 28, 1980, 55-40866

Int. Cl.³ F02M 17/00

U.S. Cl. 123—440 16 Claims

1. A method for supplying a mixture of air and fuel to an internal combustion engine at a variable air-fuel ratio in response to a concentration signal derived from an exhaust gas sensor located in an exhaust system of the engine, said signal representing the concentration of predetermined constituents of the exhaust emissions, comprising the steps of:

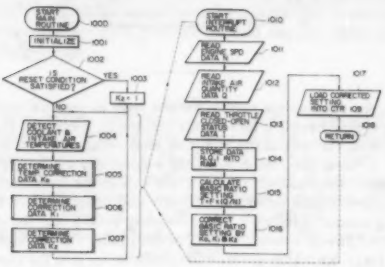
(a) generating a first corrective datum representing an

amount of said air-fuel ratio to be corrected toward an optimum value and varying as a function of time in a direction depending on said concentration signal;

(b) generating second correction data representing an amount of said air-fuel ratio to be additionally corrected toward said optimum value and varying in a direction depending on the value of said first corrective datum;

(c) detecting the air flow supplied to said engine;

(d) storing said second correction data in a selected one of first storage locations corresponding to said detected air flow when the throttle of said engine is closed, or storing said second corrective data in a selected one of second



storage locations corresponding to said detected air flow when said throttle is open;

(e) retrieving a said stored datum from said first storage locations in response to said detected air flow when said throttle is closed, or retrieving a said stored datum from said second storage locations in response to said detected air flow when said throttle is open;

(f) detecting whether the stored second corrective data are greater than a first predetermined value; and

(g) resetting said stored second corrective data to a second predetermined value if said stored second data are detected as being greater than said first predetermined value in the step (f).

4,441,474

FUEL INJECTION PUMPING APPARATUS

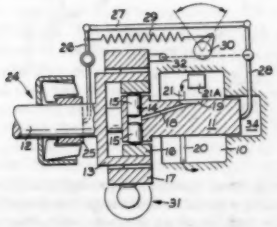
Boaz A. Jarrett, London, and Dorian F. Mowbray, Burnham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Dec. 17, 1981, Ser. No. 331,824

Claims priority, application United Kingdom, Dec. 31, 1980, 8041540

Int. Cl.³ F04B *19/00*

U.S. Cl. 123—450 **5 Claims**



1. A fuel injection pumping apparatus for supplying fuel to a multiple cylinder internal combustion engine comprising a distributor member rotatable within a body part, a transverse bore formed in the distributor member and a plunger in the bore, a multi-lobed cam for effecting inward movement of the plunger as the distributor member rotates, said distributor member being axially movable within the body part, a passage in the distributor member, said passage communicating with said bore and opening into a recess on the periphery of the distributor member, said recess having a leading and a trailing edge in relation to the direction of rotation of the distributor member, said edges being mutually inclined, a plurality of outlet ports formed in the body part for connection in use to the injection nozzles of the associated engine, said outlet ports being equiangularly spaced about the distributor member, a plurality of inlet ports alternately arranged with said outlet ports, said recess registering with said ports as the distributor member rotates, a source of fuel under pressure connected to said inlet ports, means for varying the axial setting of said distributor member, the arrangement being such that when the distributor member is in the maximum fuel position all the fuel displaced by said plunger will be delivered through an outlet port and when the plunger is in the zero fuel position all the fuel displaced by said plunger will flow through an inlet port, part of the fuel flowing through an outlet port and the remainder through an inlet port when the distributor member is in an intermediate position, and means for varying the angular setting of said cam about the axis of rotation of said distributor member and further means responsive to the position of said cam for adjusting the axial setting of the distributor member to maintain the quantity of fuel delivered by the apparatus during adjustment of the cam substantially constant.

4,441,475

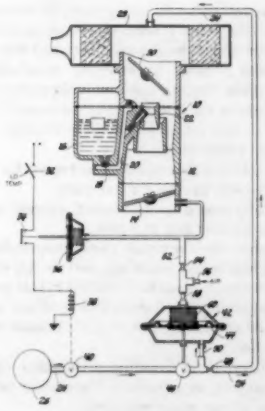
SUPPLEMENTARY FUEL SYSTEM FOR ENHANCING LOW TEMPERATURE ENGINE OPERATION

Patrick M. Bouchard, Sterling Heights, and Jack B. King, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 9, 1982, Ser. No. 396,858

Int. Cl.³ F02M *21/02*

U.S. Cl. 123—525 **1 Claim**



1. A supplementary fuel system for an engine having an induction passage for air flow to the engine, a throttle in said induction passage, and a primary fuel system adapted to deliver a low volatility fuel to the engine, said supplementary fuel system comprising a fuel passage adapted to deliver a gaseous fuel to said induction passage, a normally closed valve controlling gaseous fuel flow through said fuel passage, means for enabling opening of said valve at temperatures below a certain level, means responsive to the pressure in said induction passage downstream of said throttle for effecting closing of said valve to interrupt fuel flow through said fuel passage as said induction passage pressure increases above a predetermined

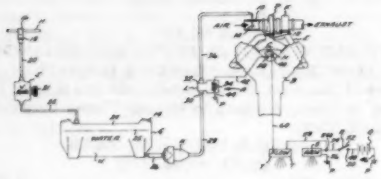
level and for effecting opening of said valve to admit fuel through said fuel passage as said induction passage pressure decreases below said predetermined level, whereby said valve cycles open and closed as said induction passage pressure varies while cranking the engine at temperatures below the certain level to limit the gaseous fuel flow as required for engine starting and whereby said valve remains open while the engine is running at temperatures below the certain level, and a pressure regulator controlling gaseous fuel flow through said fuel passage and adapted to maintain the pressure in said fuel passage proportional to the pressure in said induction passage downstream of said throttle whereby fuel flow through said fuel passage increases with air flow through said induction passage to operate the engine at temperatures below the certain level without stalling.

4,441,476

CHARGE AIR COOLING SYSTEM

James E. Roberts, 1345 Roycroft Ave., Long Beach, Calif. 90804, and Edward L. Lenarth, 7036 Schroll Ave., Lakewood, Calif. 90713

Filed Nov. 4, 1982, Ser. No. 439,116
Int. Cl.³ F02D *19/00*
U.S. Cl. 123—542 **4 Claims**



1. In an automotive vehicle powered by an internal combustion engine that has a turbine driven compressor that withdraws air from the ambient atmosphere and discharges said air at an elevated pressure to an intake manifold, said vehicle including a pressurized air actuated brake system and a battery, the improvement for intermittently increasing the density of air flowing to said intake manifold by cooling the same, said improvement comprising:

a. a reservoir that defines a confined space for storing water, said reservoir having a water outlet;

b. a normally closed, spring loaded, solenoid operated valve that has an inlet and an outlet;

c. a normally open pressure switch responsive to the pressure in said intake manifold, said switch closing when a predetermined pressure is reached in said intake manifold;

d. first means for pressuring said confined space with air from said air brake system to force pressurized water from said outlet;

e. second means for injecting pressurized water from said reservoir into air from said compressor prior to said air flowing to said intake manifold;

f. conduit means that connect said water outlet to said inlet of said solenoid operated valve and said outlet of said solenoid operated valve to said second means; and

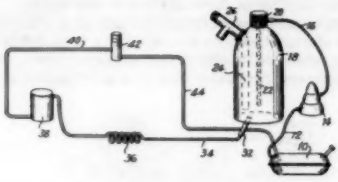
g. an electrical circuit connected to said battery, said electrical circuit including said pressure switch and solenoid operated valve, said pressure switch when said predetermined pressure is reached assuming a closed position to electrically energize said solenoid operated valve to move to an open position whereupon pressurized water flows to said second means to cool said air flowing to said intake manifold, with said flow of pressurized water continuing only so long as the pressure in said intake manifold is at least said predetermined pressure.

4,441,477

ECONOMIZER

George Holt, 1175 Grove Ave., Imperial Beach, Calif. 92032

Filed Jul. 29, 1981, Ser. No. 287,933
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **12 Claims**



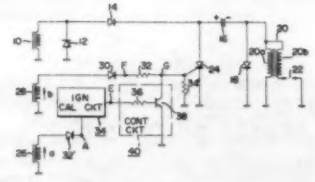
1. An economizer system for use with an internal combustion engine having a fuel tank, a fuel pump, means for feeding fuel from the tank to the pump, an intake manifold, and at least one exhaust conduit, comprising a generally cylindrical fuel evaporation chamber in which fuel vapors are mixed with air including means admitting air into said chamber, the Springling means including a tube extending axially into the chamber and having a multiplicity of perforations. Therein such that the fuel is sprinkled through the perforations into the chamber and sprinkling means the fuel from the fuel pump into the chamber; a two-way safety valve including means permitting flow of fuel vapor and air from the evaporation chamber to the intake manifold for preventing backfire from reaching the chamber but rather venting off said backfire; means connecting said two-way safety valve to the intake manifold; and means for recycling fuel that accumulates in said chamber so that such fuel can be again sprinkled into the chamber, wherein the recycling means includes a secondary fuel tank, a secondary fuel pump, and fuel lines respectively connecting the evaporation chamber to the secondary fuel tank, the secondary fuel tank to the secondary fuel pump, and the secondary fuel pump to the first-mentioned fuel tank so that fuel is returned to the latter from the evaporation chamber.

4,441,478

CONTACTLESS MAGNETO IGNITION SYSTEM

Takanori Fujimoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 227,977, Jan. 23, 1981, abandoned. This application Jan. 25, 1983, Ser. No. 460,875
Claims priority, application Japan, Feb. 8, 1980, 55-15202
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—602 **4 Claims**



1. A magneto ignition system comprising electric source means for generating a positive and a negative output in synchronism with the rotation of an internal combustion engine, and ignition coil, a rectification means operatively connected to said electric source means for passing one of said positive and negative outputs to said ignition coil after the rectification thereof, a switching element for controlling the conduction of said rectified output to said ignition coil, a first angular position sensor means for generating a first angular signal in synchronism with the rotation of said engine and corresponding to a

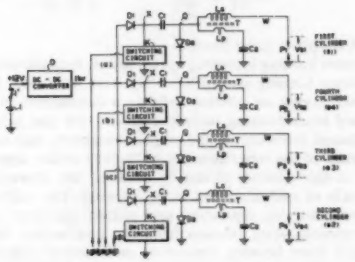
predetermined crank position of said engine, a second angular position sensor means for generating a second angular signal in synchronism with the rotation of said engine and corresponding to a crank position thereof delayed by a predetermined angle relative to said predetermined angle relative to said predetermined crank position, wherein said first and second sensor means are arranged such that said second angular signal is of a longer duration than said first angular signal and is supplied directly to said switching element, an ignition time calculating circuit for calculating an ignition time in accordance with the conditions for operating said engine with said first angular signal, and a control circuit connected to said switching element and responsive to a signal corresponding to a result of the calculation effected by said ignition time calculation circuit so as to bypass said second angular signal therethrough.

4,441,479

IGNITION SYSTEM FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE OF A VEHICLE

Hiroshi Endo, Yokosuka; Masazumi Sone, Tokyo; Iwao Imai, and Yasuki Ishikawa, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 30, 1982, Ser. No. 403,360
Claims priority, application Japan, Aug. 6, 1981, 56-122390
Int. Cl.³ F02P *5/00*
U.S. Cl. 123—605 **5 Claims**



1. An ignition system for a multi-cylinder internal combustion engine of an automotive vehicle having a plurality of spark plugs, each installed into the corresponding engine cylinder, comprising:

(a) a low DC voltage supply;

(b) a DC-DC converter which boosts a low DC voltage supply from said low DC voltage into a high DC voltage;

(c) a plurality of first capacitor sections each having a first diode connected to said DC-DC converter, a first capacitor one end thereof being connected to said first diode, and a second diode being connected between the other end of said first capacitor and ground, each of said first capacitors charged by said high DC voltage;

(d) a plurality of switching circuits, each connected between said one end of said first capacitor and ground which operatively grounds the end of said first capacitor so as to discharge the energy charged within said first capacitor;

(e) a plurality of boosting transformer sections, each connected between said corresponding first capacitor section and spark plug and having a primary winding and secondary winding, one end of said primary winding being connected to the other end of said first capacitor together with one end of said secondary winding thereof, the other end of said primary winding being grounded via a second capacitor so as to generate a damping oscillation when said corresponding switching circuit turns on to apply the charged high DC voltage thereacross, and the other end of said secondary winding being connected to the corresponding spark plug so as to boost the voltage applied across said primary winding so as to supply a discharge energy into the corresponding spark plug; and

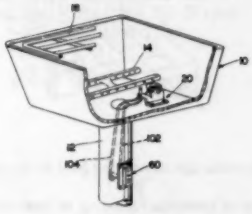
(f) an ignition control circuit which receives ignition reference signals in synchronization with the engine speed from a crank angle sensing means attached around an engine crankshaft, an engine cooling water temperature signal corresponding to the engine cooling water temperature from an engine cooling water temperature sensing means, an engine fuel intake quantity signal corresponding to fuel intake flow rate from a fuel intake quantity sensing means, and a vehicle speed signal corresponding to vehicle speed from a vehicle speed sensing means and calculates an optimum output timing and a pulse width of each output signal therefrom into said corresponding switching circuit on a basis of input signals from said sensing means, the respective output signals being sent into said switching circuits sequentially according to the ignition order at the calculated optimum output timing and pulse width thereof corresponding to the interval of time during which said corresponding switching circuit is maintained on, whereby the discharge energy supplied into the respective spark plugs changes according to the engine operating conditions so as to provide an optimum discharge energy for the respective spark plugs.

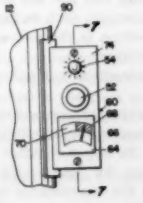
4,441,480

IGNITION INDICATOR FOR GAS GRILLS

Mark A. Rickman, Lyndhurst, and Murray Leonard, Mayfield, both of Ohio, assignors to Vernitron Corporation, Lake Success, N.Y.

Continuation of Ser. No. 941,070, Sep. 11, 1978, abandoned. This application Jan. 5, 1981, Ser. No. 222,751
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—42 **11 Claims**





1. In a covered gas grill having a dished housing which is supported by a support structure, a gas burner disposed in the dished housing, and a gas flow control means for controlling the flow of gas to the gas burner, the gas flow control means being mounted on said support structure, an igniter and indicator system to enable an operator to prevent gas explosions comprising:

a mounting bracket disposed within the dished housing contiguous to the gas burner;

at least a first electrode for forming a spark gap with a

metallic element, said first electrode being mounted on said mounting bracket;

spark indicator means for indicating the passage of an electrical spark between said first electrode and said metallic element, said spark indicator means being mounted on said mounting bracket;

a housing disposed on said supporting structure;

an ignition control means including a piezoelectric device for selectively supplying an electrical potential to said first electrode to cause a spark to jump the spark gap, said ignition control means being mounted in said housing and being operatively connected with said first electrode; and

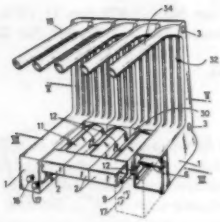
an ignition indicator means for providing visual indication of the ignition state of the burner, the ignition indicator being mounted in said housing and being operatively connected with the spark indicator means, wherein if ignition has not taken place, the state of said ignition indicator means serves as a warning to the operator that gas is accumulating in the grill and that the grill should be vented before an attempted relight of the gas burner to prevent an explosion on the attempted relight.

4,441,481

HEAT-RECOVERY DEVICE FOR OPEN HEARTH

Paul Verhaegen, Saastraat, 22, 9310 Lede, Belgium

Filed Oct. 15, 1980, Ser. No. 197,086
Claims priority, application Belgium, Oct. 17, 1979, 197681
Int. Cl.³ F24B 7/00
U.S. Cl. 126—121 **9 Claims**



1. An apparatus for recovering heat in an open hearth comprising:

a plurality of elements including at least two side elements and a plurality of intermediate elements, each having a hollow pathway permitting the passage of air between an inlet and outlet end, said elements effecting heat exchange between a burning fuel and the air traversing the pathways said side elements each including:

a horizontal partition in the pathway defining an upper and lower chamber;

an inlet for the introduction of unheated air into the lower chamber;

a first opening in the partition and spaced from the inlet to the lower chamber for admitting air from the lower chamber into the upper chamber; and

a second opening for introducing air from the upper chamber into the intermediate elements at a position spaced from the wall, said second openings so situated as to be facing each other in a lateral direction;

whereby the air introduced to the lower chambers is admitted to the upper chambers from where it diffuses both through the second openings to the intermediate elements and through the upper chambers to the wall and is thereafter exhausted through the pipe;

means connecting said elements in such a manner as to define a grate for the placement of the fuel and a wall merging with and extending away from the grate;

at least one pipe in communication with said hollow pathways for exhausting heated air carried by the elements;

means communicating between an unheated air source and the inlets of the hollow pathways; and

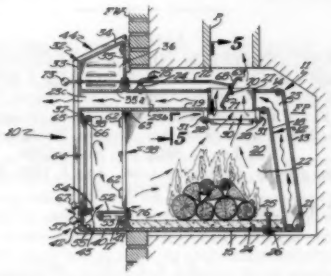
means for intercommunicating air between the element pathways intermediate the inlet and outlet ends of the elements and thereby preventing an uneven heat distribution as might cause damaging thermalstresses within the apparatus.

4,441,482

FIREPLACE INSERT

Terry L. Luscombe, Box 108, Armstrong, Iowa 50514

Continuation-in-part of Ser. No. 57,413, Jul. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,122
Int. Cl.³ F24B 7/00
U.S. Cl. 126—123 **5 Claims**



1. A fireplace insert heater,

an outer housing including upper, lower, rear and side walls,

an inner housing spaced inwardly from said outer housing and having an interior defining a combustion chamber, said inner housing including upper, rear and side walls, spaced inwardly of the respective upper, rear and side walls of the outer housing to thereby define upper, rear and side plenum chambers between the corresponding walls of said inner and outer housings, the walls of said inner housing separating said plenum chambers in non-communicating relation from the combustion chamber, said inner housing separating said plenum chambers in non-communicating relation from the combustion chamber, said inner housing having a forwardly facing opening, said inner and outer housings adapted to be positioned within a fireplace recess,

a horizontal top chamber structure secured to the top wall of the outer housing and adapted to be positioned exteriorly of the fireplace recess, a pair of laterally spaced apart side chamber structures located exteriorly of the fireplace recess and each having an interior communicating with said side plenum chambers, said side chamber structures having a common front wall extending between the side chamber structures,

an access opening in the front wall,

a pair of transparent doors hingedly mounted on said front wall,

a pair of vertically disposed metallic sectional doors hingedly connected with said inner housing and being swingable between closed and open positions, said metallic doors when in the closed position closing the forwardly facing opening in the inner housing, and when in the open position being disposed in the space between the inner housing and the front wall of the outer housing to completely expose the opening in the inner housing,

a plurality of laterally spaced apart openings in said front wall adjacent the lowe portion of the latter and extending between said side chambe structures, means for variously adjusting the size of said openings to vary the amount of air introduced into the combustion chamber,

a vertically disposed flue stack extending through the upper walls of the inner and outer housings to intercommunicate the combustion chamber with the chimmney of the fire-

place, said flue stack being spaced laterally inwardly from the respective side walls of said inner and outer housing,

a baffle plate positioned in the combustion chamber below and in confronting relation with the flue stack,

fans in said side chamber structures for impelling air rearwardly into the side plenum chambers,

and a pair of substantially flat, horizontally disposed baffle plates each being positioned in one of said side plenum chambers for directing air impelled by said fans in a rearward direction.

4,441,483

PORTABLE FURNACE FOR WEARING APPAREL

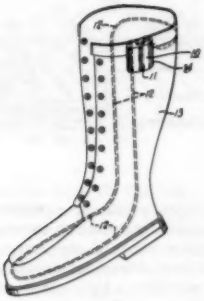
Stanley Cieslak, 14 Creek Rd., and Leonard K. Cieslak, 15 Creek Rd., both of McKees Rocks, Pa. 15136

Continuation-in-part of Ser. No. 186,954, Sep. 15, 1980, Pat. No. 4,334,519, which is a continuation-in-part of Ser. No. 49,059, Jun. 18, 1979, Pat. No. 4,281,418, which is a continuation-in-part of Ser. No. 875,815, Feb. 7, 1978, Pat. No. 4,180,922. This application Jan. 27, 1982, Ser. No. 343,151

The portion of the term of this patent subsequent to Jan. 1, 1997, has been disclaimed.

Int. Cl.³ A61F *7/00*

U.S. Cl. 126—206 **8 Claims**



1. A portable furnace for heating wearing apparel or the like comprising, a compact closed container for containing a liquid therein and capable of being readily carried on a person, a second container received in said closed container and adapted to receive heating element means therein through an opening to the exterior and having at least a portion of the exterior walls of said second container exposed to the interior of said compact container for heat transfer through said walls to a liquid to be contained within said compact container, a flexible liquid conduit having both ends thereof connected for circulation of heated liquid from said compact container through said conduit, and positive displacement pump means connected to said conduit for hand manipulation to circulate heated liquid from said compact container through said conduit on demand.

4,441,484

CHEMICAL HEAT PUMP

Leonard Greiner, 2853-A Hickory Pl., Costa Mesa, Calif. 92626

Division of Ser. No. 135,726, Mar. 31, 1980, abandoned, which is a division of Ser. No. 958,507, Nov. 7, 1978, Pat. No. 4,224,803, which is a continuation-in-part of Ser. No. 842,702, Oct. 17, 1977, Pat. No. 4,272,268. This application Nov. 12, 1981, Ser. No. 320,332

Int. Cl.³ F24J *3/02*

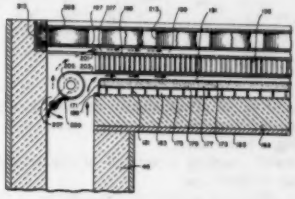
U.S. Cl. 126—436 **1 Claim**

1. A solar collector, comprising:

a surface for absorbing solar radiations;

a pair of spaced transparent covers mounted over said absorbing surface, said solar radiation passing through said covers to impinge upon said absorbing surface, said pair of spaced, transparent covers forming a tapered heat exchange fluid duct, said duct being tapered sufficiently to maintain low thermal eddy current flow in said heat exchange fluid as the temperature thereof increases in passing through said duct while still maintaining said duct sufficiently thin to assure substantial heat transfer to said heat exchange fluid,

means for alternately ducting heat exchange fluid between one of said pair of spaced, transparent covers and said surface; and



a reflective screen selectively positionable between said one of said pair of spaced, transparent covers and said surface, said screen reflecting radiant thermal energy when said heat exchange fluid is ducted between said one of said spaced, transparent covers and said surface, said screen, when positioned between one of said pair of spaced, transparent covers and said surface, defines one side of a flow channel for conducting said heat exchange fluid.

4,441,485

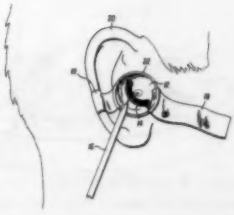
MOVEMENT DAMPENING EAR SPECULUM

William V. Reynolds, 375 Main St., Oneonta, N.Y. 13820

Filed May 7, 1981, Ser. No. 261,364

Int. Cl.³ A61B *1/22*

U.S. Cl. 128—9 **7 Claims**



1. A surgical unit for the human ear, comprising:

a speculum for insertion into the human ear;

a coiled-spring attached to the inner wall of said speculum; said coiled-spring extending circumferentially within said speculum and conforming to the inner circular wall of said speculum;

means for securing the speculum in intimate contact with the human ear;

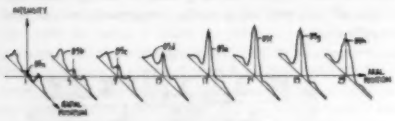
and

a surgical instrument extending through said speculum and inserted between the coils of said coiled-spring to an area of the ear where surgery is to be performed; said coils of said coiled-spring supporting said surgical instrument to impede sudden involuntary inward and lateral movements made by an operating surgeon to thereby prevent damage to the ear, and said coils of said coiled-spring controlling the voluntary movements of the operating surgeon to thereby enhance the operation and increase the success rate of the surgery.

4,441,486
HYPERTHERMIA SYSTEM

Douglas W. Pounds, Menlo Park, Calif., assignor to Board of Trustees of Leland Stanford Jr. University, Stanford, Calif.

Filed Oct. 27, 1981, Ser. No. 315,579
Int. Cl.³ A61B 5/00
U.S. Cl. 128—24 A 19 Claims



1. A method of ultrasonically heating a subject volume comprising the steps of:

providing a transducer;

acoustically coupling a surface of the transducer to the subject volume; and

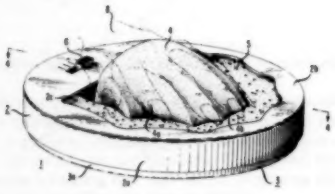
exciting vibrations within the transducer so that compressional mode vibrations are suppressed over a generally central region of the surface;

the suppression of compressional mode vibrations providing an intensity pattern characterized by relatively low intensities in the regions of the subject volume at depths extending out to a transition distance, with a relatively high intensity on-axis peak in a region beyond the transition distance whereupon a discrete portion of the subject volume may be subjected to considerable heating without appreciable heating of the intervening portions.

4,441,487
COSMETIC AND THERAPEUTIC APPLIANCE

Carol A. Daugherty, Washington; Larry N. Siebens, Whippany, and Ronald R. Daugherty, Washington, all of N.J., assignors to R. D. Design Co., Inc., Washington, N.J.

Filed Jun. 15, 1981, Ser. No. 273,364
Int. Cl.³ A61H 21/00
U.S. Cl. 128—24.2 9 Claims



1. An apparatus for hand treatment which comprises in combination:

A shallow container constructed to hold a quantity of treating oil therein and having a top edge surface, a bottom surface and peripheral wall surfaces having a central opening therein;

A handrest, said handrest being formed of substantially rigid material contoured in a convex curvature on its upper side, and substantially hollow on its underside, said convex curvature shaped to accomodate a hand for treatment with the fingers in outstretched separated positions so that the palm rests near the zenith of said curvature and the fingers depend against the sides with their respective ends near the lower periphery of said handrest;

said handrest being disposed in said central opening, the inner peripheral wall of said container being spread-apart from the outer periphery of said handrest and forming a semi-annular gap therebetween and said zenith of said curvature extending above said top surface;

a strip of sponge disposed in said gap to at least partially surround said inner peripheral wall of said container and being slightly spaced apart from the outer periphery of said handrest to accomodate the ends of the fingers of said treated hand in contact with said sponge;

means comprising an electrical heater disposed in heat transfer relation to said container for heating said oil to a temperature above room temperature;

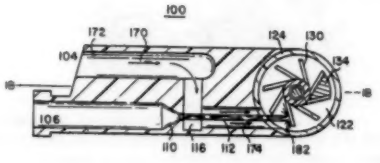
vibrator means coupled to the hollow underside of said handrest and constructed to impose a vibratory motion on said handrest; and

electrical circuit means connectable in energy transfer relation between said heater and said vibrator means and a source of power for energizing said heater and said vibrator.

4,441,488
HYDRO-AIR VIBRATOR MASSAGE APPARATUS

L. Cedric Macabee, Scotts Valley, Calif., assignor to David K. Macabee, Carlsbad, Calif.

Continuation of Ser. No. 121,363, Feb. 14, 1980, abandoned. This application Feb. 9, 1981, Ser. No. 232,952
Int. Cl.³ A61H 9/00
U.S. Cl. 128—66 27 Claims



1. Water-air massage apparatus for combining a cyclic massage displacement generally parallel to the region under massage, with the pressure effect of compressing and releasing entrained air in the form of breaking air bubbles, comprising:

water source for providing a high velocity water jet flow in a direction generally parallel to the region under massage;

air source for exposing the water jet flow to air forming an sheath flow of air;

elongated channel means extending in a direction generally parallel to the region under massage, having a receiving end for receiving the water jet flow and the sheath air flow, and having an exit end for providing an exit flow of water and air;

housing means with a chamber therein for receiving and mixing the exit flow from the channel means;

rotor means rotatably mounted within the chamber and rotationally responsive to the exit flow about a rotation axis generally orthogonal to the region under massage, the rotor means having a center of mass offset from the rotation axis thereof for causing a rotational eccentricity sufficient to establish a circular counter action housing motion generally parallel to the region under massage;

perforated closure means across the housing generally parallel to the region under massage, forming a plurality of output streams of water-air mixture in a direction toward the region under massage;

baffle diversion means within the housing for receiving the water-air mixture from the chamber and redirecting the water-air mixture from a rotational flow within the chamber to a directional flow towards the region under massage, out the perforations of the closure means, the perforations restricting the flow of the output streams causing a back presure within the diversion means which compresses the air in the mixture, the compressed air expanding and rupturing after passing through the perferations creating temporary pressure bursts in the output streams;

an open ended massage chamber formed by a rim means

extending from the closure means for defining the region under massage and receiving and intensifying the output streams; and

resilent means extending from the closure means for engaging and laterally disturbing the region under massage by the housing counter motion in a circular displacement pattern generally parallel to the region under massage.

4,441,489

ORTHOPAEDIC SPLINTS

David M. Evans, Farnham Common, and Barry O. Weightman, Thames Ditton, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 8, 1582, Ser. No. 355,623

Claims priority, application United Kingdom, Mar. 10, 1981, 8107537

Int. Cl.³ A61F 5/10

U.S. Cl. 128—77 **9 Claims**

1. An orthopaedic splint for the finger comprising a first portion and a second portion respectively for location distally and proximally of the proximal interphalangeal joint; said first portion including two plates each curved to seat in one of palmar and dorsal dispositions round a phalanx, said plates each having a respective strap to hold the same releasably so seated, and said plates being interconnected in mutually inclined manner for respective location distally and proximally of the distal interphalangeal joint to hold this joint in hyperextension; and said first and second portions being resiliently and hingedly interconnected to hold the proximal interphalangeal joint in flexion while allowing restrained extension against the spring force of this last interconnection.

4,441,490

WRIST BRACE

Robert P. Nirschl, 4143 N. River St., Arlington, Va. 22207

Filed Sep. 23, 1982, Ser. No. 421,966

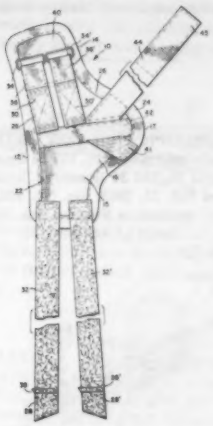
Int. Cl.³ A61F 5/10

U.S. Cl. 128—77 **12 Claims**

1. A brace capable of being wrapped about the wrist and dorsal area of the hand and capable of applying pressure to a wide area of the wrist and hand to thereby relieve internal tension of the wrist, comprising: an elongated pad, said paid being substantially flexible in all directions and having a laminate with an inner layer of resilient foamed material bonded to an outer layer of substantially inelastic flexible sheet; having,

(a) a main body with one long edge slightly convexly arcuately-shaped, an opposing long edge, a first end and a second end;

(b) a substantially triangular projection extending away from the main body having a rigid reinforcing member attached parallel to the forearm along the main body and the projection; and



(c) fastening means for securing the brace tightly about the wrist and dorsal area of the hand.

4,441,491

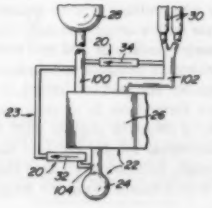
PRESSURE RELIEF VALVE SYSTEM FOR PENILE IMPLANT DEVICE

Alvin S. Evans, Sr., 234 Shubert Ave., Runnemede, N.J. 08078

Filed Aug. 13, 1982, Ser. No. 407,969

Int. Cl.³ A61F 5/00

U.S. Cl. 128—79 **10 Claims**



1. A pressure relief valve system for use in combination with a penile implant device which is used for simulating a natural erection, wherein said penile implant device includes bladder means which are implanted within the penis, a fluid containing reservoir and primary unidirectional valve means which are respectively, implanted at remote locations thereto and pump means which is implanted in the scrotum, said primary unidirectional valve means permitting fluid to pass from said pump means to said bladder means while precluding fluid from passing in the opposite direction, wherein said system comprises pressure relief valve means arranged to provide uni-directional fluid communication between said pump means and said reservoir, said pressure relief valve means being interposed in the path of fluid communication between said pump means and said primary unidirectional valve means, thus enabling fluid to bypass said primary unidirectional valve means and said bladder means by passing from said pump means to said reservoir whenever said fluid pressure adjacent said pump means is greater than a first predetermined amount and precluding fluid from passing therealong whenever said pressure is less than said first predetermined amount, said pressure relief valve means thus establishing a maximum amount of fluid pressure

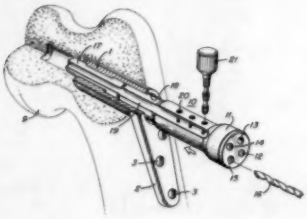
which can be pumped into said bladder means with said pump means, yet not limiting the amount of pressure which can otherwise be maintained in said bladder means.

4,441,492

AID FOR TELESCOPIC NAIL FOR ORTHOPEDIC USE

Nils Rydell, Stenhammarsvägen 25, 161 52 Bromma, and Ragnar Kalen, Golfvägen 26, 181 31 Danderyd, both of Sweden

Filed Feb. 23, 1983, Ser. No. 468,967
Claims priority, application Sweden, Sep. 29, 1982, 8205544
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—92 EB **10 Claims**



1. Auxiliary tool to be used with a telescopic compression system for orthopedic application, said telescopic system comprising a compression plate means having a hollow barrel member provided with means for coacting with a nail means to nonrotatably join said plate means and a bone fragment located on a side opposite the plate means across the fractured site, wherein said barrel member being provided on its inner surface with at least one longitudinal groove extending the length thereof to cooperate with a complementary longitudinal ridge formed on the exterior surface of said nail means;

said tool comprising an elongate rod designed to fit within said barrel member and said rod having at least one longitudinal groove formed on its exterior surface such that when the tool is properly aligned with the longitudinal groove of said barrel means, the two coacting grooves form an essentially cylindrical channel thereby providing guidance for a drill means along the length of said channel.

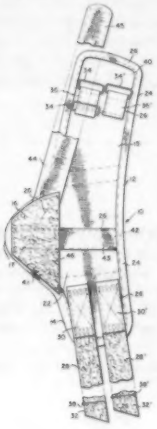
4,441,493

ELBOW BRACE

Robert P. Nirschl, 4143 N. River St., Arlington, Va. 22207

Filed Sep. 23, 1982, Ser. No. 422,349
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—165 **12 Claims**

1. A brace device capable of being wrapped about the elbow and forearm and capable of applying pressure to a wide area of the elbow to thereby relieve internal musculo-tendonous tension about the elbow, comprising: a substantially curvilinear, elongated pad of a generally conical shape when wrapped about the elbow and forearm, the pad being substantially flexible in all directions and having a laminate with an inner layer of resilient foamed material bonded to an outer layer of substantially inelastic flexible sheet, the pad further having a main body, a substantially triangular projection extending therefrom, and fastening means for securing the support device tightly about the elbow and forearm; the main body having one long edge convexly arcuately-shaped, an opposing long edge, a first end and a second end; and the projection extending away from the main body and having a rigid reinforcing member



extending parallel to the forearm along the projection and into the main body.

4,441,494

COLD WEATHER BREATHING DEVICE

Anthony P. Montalbano, 29 Hitching Post La., Glen Cove, N.Y. 11542

Filed Mar. 2, 1981, Ser. No. 239,497
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.17 **21 Claims**

1. A cold weather device comprising:

a mouthpiece (1) which is engageable only with the mouth area of a user and which is insertable in the mouth of the user and substantially provides a seal to the mouth of the user, said mouthpiece not extending to the nose of the user and leaving the nose of the user uncovered;

a valve housing (2) coupled to said mouthpiece (1) and in air communication with only the mouth of the user via said mouthpiece (1), and being out of air communication with the nose of the user;

a conduit (7) extending downwardly from said valve housing (2) and in selective air communication with said mouthpiece (1) via said valve housing (2);

a first valve (4) in said valve housing (2) and in air communication with said conduit (7) and mouthpiece (1) for providing an air communication path between said conduit and said mouthpiece when the user inhales, and for block-

ing said air communication path between said conduit and mouthpiece when the user exhales;

an exhaust opening in said valve housing (2) and being in selective air communication with said mouthpiece (1) for selectively exhausting exhaled air to the atmosphere;

a second valve (3) in said valve housing (2) and coupled between said exhaust opening and said mouthpiece (1) for providing an air communication path between said mouthpiece and said exhaust opening when the user exhales, and for blocking said air communication path between said exhaust opening and mouthpiece when the user inhales; and

a shield unit having a top end, opposite sides, a bottom end and a substantially central portion, said shield unit including a substantially air impervious shield member (8) coupled to an end portion of said conduit (7) remote from said mouthpiece (1) and a first and second plurality of spaced apart projecting ribs (9) extending from one side of said shield member (8), adjacent ribs defining with said shield member (8) a plurality of elongated, generally U-shaped, substantially unrestricted air passage channels (10), said first plurality of ribs being on one side of said substantially central portion of said shield unit and said ribs of said first plurality of ribs having one end located adjacent the periphery of said shield member (8) and an opposite end located adjacent said substantially central portion of said shield member, said second plurality of ribs being on the other side of said substantially central portion of said shield unit and said ribs of said second plurality of ribs having one end located adjacent the periphery of said shield member (8) and an opposite end located adjacent said substantially central portion of said shield member, a substantially central air passage (15) being defined between opposite ends of said first and second pluralities of ribs, said substantially central air passage (15) being in substantially unrestricted fluid communication with said generally U-shaped air passage channels (10), said substantially unrestricted air passage channels (10) substantially unrestrictedly opening to the periphery of said shield unit (8) and extending substantially unrestrictedly from at least said openings at said periphery of said shield unit to said substantially central air passage (15), said shield unit being coupled to said conduit (7) such that said substantially unrestricted air passage channels (10) are in substantially unrestricted air communication with the interior of said conduit (7) via said substantially central air passage (15) to provide substantially unrestricted flow of air from the periphery of said shield unit to the interior of said conduit (7) and to said mouthpiece (1), whereby said shield unit is adapted to be placed against a body portion of a user to provide substantially unrestricted open-ended air flow passages through said U-shaped air passage channels, said substantially central air passage and to said mouthiece via said conduit whereby the body heat of the user heats cold air passing therethrough.

4,441,495

DETACHABLE BALLOON CATHETER DEVICE AND METHOD OF USE

Daniel Hicswa, Saddle Brook, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

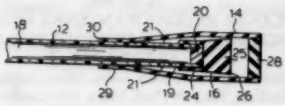
Filed Aug. 16, 1982, Ser. No. 408,344
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—325 **12 Claims**

1. A detachable balloon catheter device comprising:

a resilient tubular cannula with a lumen extending therethrough having a proximal portion adapted for connection to a source of external fluid and having its lumen closed at the distal end thereof, the distal portion of said cannula including fluid passage means through the circumferential wall thereof in communication with said lumen;

a plug detachably connected to the distal portion of said cannula without blocking said fluid passage means; and

an inflatable balloon detachably connected to the distal portion of said cannula covering said plug and said fluid passage means, said balloon having an opening normally in fluid-tight engagement around said cannula, said cannula being slidable proximally through said opening when the balloon is



inflated to disengage said plug therefrom and position the plug in fluid-tight engagement in said opening interiorly of said balloon to thereby detach said cannula from said inflated balloon.

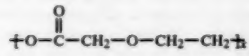
4,441,496

COPOLYMERS OF P-DIOXANONE AND 2,5-MORPHOLINEDIONES AND SURGICAL DEVICES FORMED THEREFROM HAVING ACCELERATED ABSORPTION CHARACTERISTICS

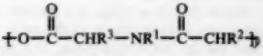
Shalaby W. Shalaby, and Donald F. Koelmel, both of Lebanon, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 8, 1982, Ser. No. 346,809
Int. Cl.³ A61L *17/00*; A61F *1/24*
U.S. Cl. 128—335.5 **18 Claims**

1. A copolymer, comprising a multiplicity of recurring A and B units, having the following general formula:



A



B

wherein x and y are integers, such that the A units comprise 85–99 mole percent, and the B units comprise 1–15 mole percent of the copolymer and R^1, R^2 and R^3 are each hydrogen or lower alkyl and may be the same or different.

4,441,497

UNIVERSAL SUTURE PASSER

Franklin T. Paudler, 13820 Somerset La. Southeast, Bellevue, Wash. 98006

Filed Oct. 21, 1982, Ser. No. 435,731
Int. Cl.³ A61B *17/06, 17/04, 17/34*
U.S. Cl. 128—339 **9 Claims**

1. An apparatus for guiding sutures through body tissue or the like comprises:

a plurality of elongated flexible members of approximately equal length, the members disposed alongside one another and joined together at each end to define an open space between each pair of members for receiving a suture

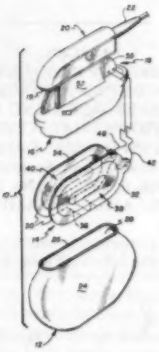
therethrough, each open space decreasing in size as it approaches one of the joined ends of the members to define a region adjacent such joined end for securing a suture between the members.

4,441,498

PLANAR RECEIVER ANTENNA COIL FOR PROGRAMMABLE ELECTROMEDICAL PULSE GENERATOR

Neal F. Nordling, White Bear Lake, Minn., assignor to Cardio-Pace Medical, Inc., St. Paul, Minn. and Cardio-Pace Medical, Inc., St. Paul, Minn.

Filed May 10, 1982, Ser. No. 376,300
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 P **5 Claims**



1. An implantable, programmable, electromedical pulse generator for implanting in a body of a patient to provide an electrical pulse signal to body tissue of the patient via an electrode connected to the pulse generator, the pulse generator having programmable operating parameters based upon radio frequency (RF) signals from a transmitter located outside the patient, the pulse generator comprising:

a hermetically sealed housing having first and second generally parallel side walls and a bottom;

a terminal supported by the housing for connection to the electrode;

a flexible resilient insulating substrate having a first zone, a second zone, and a third intermediate zone which connects the first and second zones, the flexible resilient insulating substrate being bent in a U-shape and being resiliently positioned within the housing with the first zone being resiliently urged into engagement with an inner surface of the first side wall, the second zone being resiliently urged into engagement with an inner surface of the second side wall, and the third intermediate zone being positioned adjacent an inner surface of the bottom of the housing;

a first planar wire-wound air core coil antenna for receiving the RF signals, the first antenna being carried by the first zone of the flexible insulating substrate;

a second planar wire-wound air core coil antenna for receiving the RF signals, the second antenna being carried by the second zone of the flexible insulating substrate, so that the first and second antennae are in generally parallel relationship;

a battery contained within the housing between the first and second zones of the flexible insulating substrate; and

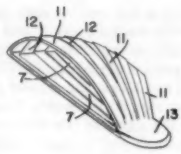
programmable pulse generator means connected to the battery, the terminal and the first and second antennae for producing the electrical pulse signal based upon programmable operating parameters determined by the radio frequency (RF) signals received by the first and second antennae, the programmable pulse generator means being contained within the housing between the first and second zones of the flexible insulating substrate.

4,441,499

DYNAMIC ORTHOTIC PLATFORM

John E. Comparetto, P.O. Box 408, Chincoteague, Va. 23336, and Paul R. Glaser, 8 Ford Pl., Dix Hills, N.Y. 11746

Filed May 7, 1980, Ser. No. 147,675
Int. Cl.³ A61F *5/14*
U.S. Cl. 128—595 **6 Claims**



1. An orthotic platform apparatus to optimize biomechanical correction of the human foot comprising:

upper element means forming a passive platform segment means with end and medial portions,

lower element strap means with end and medial portions,

said passive platform means extending from one end and longitudinally forming fan-like continuous ray members to correspond to first through fifth metatarsal bones of the human foot,

passive platform segment means for each ray to support the human foot,

elastomeric assisting strap means to comply with normal transverse parabola at metatarsal heads of the human foot,

passive platform segment means secured to one another,

elastomeric adjustable strap means to increase amplitude at the passive platform segment means to conform to foot arch while a human is in standing position,

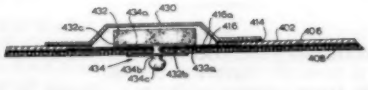
adjustable strap means being secured to the passive platform means at an end portion to form a heel seat.

4,441,500

EKG ELECTRODE

Robert W. Sessions, Burr Ridge; Jerome Jeslis, Chicago, and Richard A. Rodzen, Bolingbrook, all of Ill., assignors to Ferris Manufacturing Corp., Hinsdale, Ill.

Continuation-in-part of Ser. No. 141,057, Apr. 17, 1980, Pat. No. 4,353,373. This application Mar. 25, 1981, Ser. No. 247,560
The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—641 **6 Claims**



1. An improved EKG electrode comprising:

an annular plastic base liner with a centrally located hole therein;

a circular plastic disk removably attached to a first side of said base liner covering said hole;

a circular plastic fabric member with a layer of adhesive on a first surface concentrically positioned with respect to said disk and attached thereto by said layer of adhesive, said fabric member is removably attached at said first surface to said first side of said base liner;

means for electrical connection, said means extends at least through said circular plastic disk with a first portion lo-

cated adjacent a first side of said disk, and essentially centered with respect to said hole in said base liner, and a second portion which extends outwardly from on opposite side of said circular plastic disk,

a jel impregnated foam cylinder essentially centered with respect to said hole and extending in part therethrough with a planar end surface covering said first portion of said means for electrical connection, a part of said planar end surface is attached to a portion of said first side of said disk;

a layer of adhesive formed on a second side of said base liner, said layer of adhesive extending continuously across said base layer from edge to edge thereof and surrounding said centrally located hole;

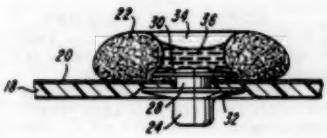
a plastic cover with integrally formed planar sealing members, said planar sealing members are sealingly affixed to said second side of said base liner by said continuous layer of adhesive with said cover, said liner and said disk forming a sealed moisture retaining region such that said jel in said disk is prevented from drying out and hardening.

4,441,501

MEDICAL ELECTRODE

James R. Parent, Dayton, Ohio, assignor to NDM Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 356,096
Int. Cl.³ A61B 5/04
U.S. Cl. 128—641 **9 Claims**



1. A medical electrode of the type adapted to be adhered to the skin comprising:

a flexible supporting sheet coated with adhesive on one side for adhesion to the skin of a patient and comprising a material which is substantially impervious to moisture and water vapor;

an electrically conducting connector abutting said sheet on the side thereof opposite said one side for connection to external equipment;

a gel pad engaging said adhesively coated surface of said sheet comprising a foam sponge having its outer margins spaced inwardly from the outer margins of said adhesively coated surface of said sheet;

an electrolyte engaging conductor engaged with said gel pad having a first portion having one surface facing the same direction as said adhesively coated surface and an opposite surface facing toward said adhesively coated surface, having a second portion integral with the first portion extending through said gel pad and through said sheet into engagement with said connector, a portion of said gel pad being squeezed between said first portion of said conductor and said adhesively coated surface, the outer margin of said first portion being spaced inwardly from the outer margin of said gel pad so that only a portion of said gel pad is squeezed between said first portion and said adhesively coated surface, the portions of said gel pad surrounding said first portion of said conductor projecting substantially further from said adhesively coated surface than said first portion of said conductor and forming with said first portion of said conductor a cup-like cavity; and

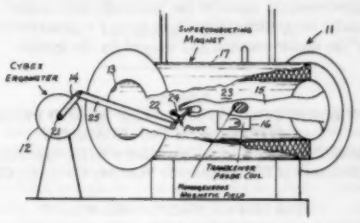
an electrolyte gel within said cavity and at least partially filling said gel pad.

4,441,502

NMR SYSTEM FOR DETERMINING RELATIONSHIP BETWEEN WORK OUTPUT AND OXIDATIVE PHOSPHORYLATION CAPABILITY IN AN EXERCISING BODY MEMBER

Britton Chance, c/o Johnson Research Foundation, School of Medicine, University of Pennsylvania, Philadelphia, Pa. 19104

Filed Aug. 19, 1982, Ser. No. 409,554
Int. Cl.³ A61B 5/05
U.S. Cl. 128—653 **8 Claims**



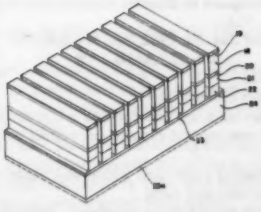
1. An apparatus for determining the relationship between work output of an exercising living body member and the capability of oxidative phosphorylation of said body member, comprising a NMR analytical device of the type including a hollow magnet provided with an internal radio frequency transceiver coupling element mounted to be in electrical coupling relation to a body member inserted in the magnet, for generating curves depicting the intensities of phosphorus-containing components in the body member, including phosphocreatine (PCr) and inorganic phosphate (P_i), whose intensity ratio varies in accordance with the amount of work performed by the body member, an ergometer mounted adjacent to the magnet, drive means movably mounted in the magnet and being drivingly operable by the body member when said body member is in said coupling relation to said coupling element, and linkage means coupling said movable drive means to the ergometer, for registering the work performed by the body member when it operates said drive means, enabling a comparison to be made between the intensity ratio with the body member at rest and the intensity ratio following the performance of a measured amount of work by said body member.

4,441,503

COLLIMATION OF ULTRASONIC LINEAR ARRAY TRANSDUCER

Matthew O'Donnell, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,140
Int. Cl.³ A61B 10/00; H01L 41/22
U.S. Cl. 128—660 **5 Claims**



3. An improved ultrasonic phased array transducer for a sector scan imaging system comprising:

a linear transducer array which transmits pulses of ultra-

sound at many scan angles to scan a sector of the human body and is comprised of a plurality of transducer elements each of which generates ultrasonic waves and to which are attached fully cut through impedance matching layers, a wear plate covering said elements and matching layers; and

a continuous collimator plate adjacent to said wear plate which exhibits critical angle effects and transmits and totally reflects ultrasonic waves emitted by every element whose angle of incidence of respectively less than and greater than the critical angle, said critical angle being approximately equal to the maximum scan angle;

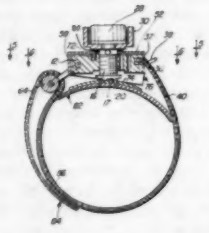
whereby insignificant ultrasonic energy is generated outside of the sector scanned and imaged by the system.

4,441,504

ELECTRONIC CUFF TO MONITOR BLOOD PRESSURE IN POLYGRAPH INSTRUMENTS

Donald A. Peterson, Berwyn, and Henry K. Skrzypczak, Westchester, both of Ill., assignors to Stoelting Company, Chicago, Ill.

Filed May 10, 1982, Ser. No. 376,675
Int. Cl.³ A61B 5/02
U.S. Cl. 128—686 **8 Claims**



1. A non-invasive, non-pneumatic cuff for use in polygraph testing comprising a load cell, strain gauges on said load cell adapted to be connected to a polygraph instrument by a cable, a curved plate pivotally connected to said load cell, a combination screw and clutch to properly pressurize the plate and load cell against the arm of a subject to be examined, an arm band being adapted to secure said plate and load cell to the arm of the subject, said arm band having two ends, said load cell being provided with an end channel, one end of said arm band being securely anchored in said end channel.

4,441,505

SENSING DEVICE FOR HUMAN LUNG EXHALATION/INHALATION AIR FLOW MEASUREMENT

Raymond A. Edwards, and Keith F. Edwards, both of Tuxedo Park, N.Y., assignors to Kinetics Measurement Corp., Upper Saddle River, N.J.

Filed Jan. 11, 1982, Ser. No. 338,373
Int. Cl.³ A61B 5/08
U.S. Cl. 128—726 **6 Claims**

1. A spirometer comprising:

a container having a top end cap and a bottom end cap;

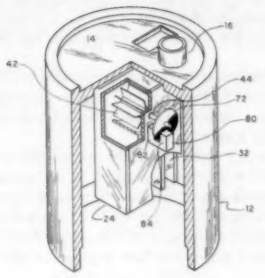
an opening in said top end cap and an opening in said bottom end cap;

an air flow housing positioned within said container extending between said end caps;

an air flow path extending longitudinally through said housing, said path terminating at one end in an air inlet communicating with said opening in said top end cap and at the opposite end in an outlet communicating with said opening in said bottom end cap;

an arcuate cavity in said housing communicating with said flow path and extending transversely thereto;

a multi-blade paddle wheel type rotor mounted coaxially with said cavity for rotation within said housing with the blades of said rotor extending partially across said flow path;



an air gap defined between the ends of the blades and the housing, the ratio of the cross-sectional area of said air gap to said inlet being approximately 1:3; and,

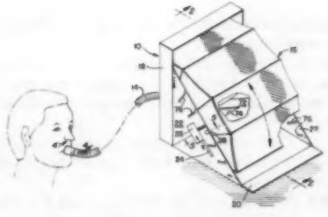
means for counting the rotations of said rotor when air is inhaled or exhaled through said top end cap opening.

4,441,506

RESPIRATORY EXERCISER

Norman R. McCombs, 109 Millwood La., Tonawanda, N.Y. 14150, and Grace N. McCombs, Tonawanda, N.Y., assignors to Norman McCombs, Tonawanda, N.Y.

Filed May 18, 1981, Ser. No. 264,969
Int. Cl.³ A61B 5/08; A63B 23/00
U.S. Cl. 128—728 **52 Claims**



1. An air handling device comprising a bellows which expands and collapses in book-like fashion, said bellows comprising a pair of outer vanes and at least one other vane between said outer vanes, hinge means joining one corresponding portion of all of said vanes together to permit said book-like expanding and collapsing of said bellows, air impervious sheet material fixed to said corresponding portions of said pair of outer vanes to form a substantially air-tight space within the bellows defined by said pair of outer vanes and said sheet material, air flow means to provide access for air into and out of said bellows adapting said device to function as an incentive breathing exerciser; all of said vanes, said sheet material, said hinge means, and said access means being so selected that said bellows is sufficiently inexpensive that it may be disposed of after a single user is done using it, wherein one of said outer vanes is a moving vane and moves with respect to the other of said outer vanes during use of said device, said other of said outer vanes being a non-moving vane, and mounting means for mounting said non-moving vane substantially vertically during use of said exerciser with said hinge means at the lower end of said non-moving vane, whereby the force of gravity tends to

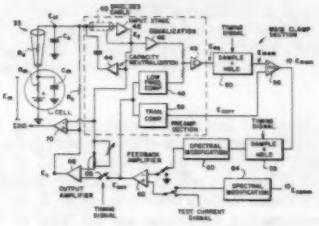
pull said moving vane and re-expand said bellows after each user's inspirational breath collapses said bellows, and whereby each user's inspirational breath collapses said bellows by drawing said moving vane against the force of gravity towards said non-moving vane.

4,441,507

HIGH SPEED SINGLE ELECTRODE MEMBRANE VOLTAGE CLAMP

Morris Steffin, 27 Bell Canyon Rd., Bell Canyon, Calif. 91370

Filed Nov. 30, 1981, Ser. No. 325,977
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—734 **23 Claims**



1. In a single electrode voltage clamp used to study neuronal cells, said clamp including voltage measurement circuitry for determining the membrane potential of a cell during a measurement interval and feedback circuitry for comparing the determined membrane potential with a command potential and injecting current into the cell during a current injection interval as a function of the difference between the membrane potential and command potential, wherein the value of command potential varies at a relatively low cell frequency and switching between voltage measurement and current injection occurs at a much higher frequency, wherein the voltage measurement circuitry includes an input section for amplifying the output of the electrode, the improvement for increasing the speed of the clamp circuit comprising capacitance compensation means for separately minimizing both low frequency and high frequency response aberrations of the input section caused by shunt capacitance of the electrode.

4,441,508

THERMOGRAPHIC CHOLESTERIC COATING COMPOSITIONS AND PLATES

William L. Buirley, Dayton; Donald E. Koopman, Miami Township, Miami County; David B. McQuain, Dayton, and William H. Reeves, Englewood, all of Ohio, assignors to Vectra International Corporation, Miamisburg, Ohio

Continuation-in-part of Ser. No. 45,276, Jun. 4, 1979, Pat. No. 4,301,054. This application Nov. 16, 1981, Ser. No. 321,620
The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.
Int. Cl.³ A61B *10/00*; C09K *3/34*
U.S. Cl. 128—736 **18 Claims**

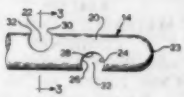
1. A thermographic plate particularly for medical investigation comprising a polymer film substrate sheet and a coat of about 1 to 6 mils thickness comprising single-droplet microcapsules having transparent wall material, and having core material consisting essentially of about 55 to about 75% of cholesteryl pelargonate, about 14 to about 35% of isostearyl cholesteryl carbonate, about 2.0 to about 6.0% of cholesteryl propionate and about 4.5 to about 7.2% of cholesteryl chloride.

4,441,509

ENDOMETRIAL SAMPLING DEVICE

Peter N. Kotsifas, Lake St. Louis; Victor H. Wetzel, Bridgetnn, and Richard W. Gilson, Dellwood, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed May 21, 1981, Ser. No. 265,763
Int. Cl.³ A61B *1/00, 17/22*
U.S. Cl. 128—757 **7 Claims**



1. An endometrial sampler comprising an elongate, flexible, plastic specimen collection probe being solid in cross-section, and a handle connected to said probe for manually grasping the sampler and inserting said probe into the uterus of a patient and for retracting said probe from the uterus to obtain a specimen therefrom for clinical analysis, said probe having a groove therein adjacent the distal end thereof extending substantially normal to the longitudinal axis of said probe, said groove having a bottom wall and axially spaced opposed proximal and distal sidewalls, said distal sidewall intersecting the outer periphery of said probe at an acute angle to provide a sharp scraping edge at the periphery of said probe and having a distal sidewall portion extending proximally to overhang said groove, said edge extending circumferentially in a smoothly curving configuration, the minimum width of the mouth of said groove measured along a line parallel to the longitudinal axis of said probe being less than the maximum width dimension of the groove measured along a line parallel to the longitudinal axis of said probe.

4,441,510

METHOD AND APPARATUS FOR FETAL PH SCALP STUDIES

Michael W. Worley, deceased, late of Salt Lake City, Utah, and by Shauna Worley, legal representative, 2021 Hollywood Ave., Salt Lake City, Utah 84101

Filed Jul. 25, 1980, Ser. No. 172,254
Int. Cl.³ G01N *33/16*
U.S. Cl. 128—763 **3 Claims**

1. Apparatus for obtaining blood for fetal pH scalp studies comprising

an elongate, substantially rigid, tubular handle;

an aspirator needle having its pointed end projecting from one end of the tubular handle and its other end opening into the handle;

a capillary tube having a self-sealing cap on one end thereof through which the pointed end of the needle is inserted to extend into the capillary tube, and heparin on the inner wall thereof, and a metal flea therein;

a yieldable collar surrounding the capillary tube a spaced distance from the self sealing cap and adjacent the one end of the capillary tube; and

a magnet encircling the capillary tube between the self-sealing cap and the yieldable collar, said magnet having a bore

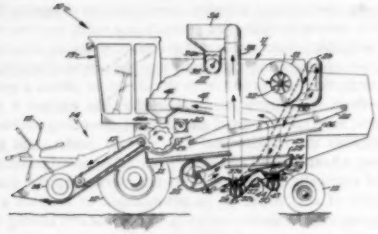
dimensioned to slide over the collar upon application of sufficient force to said magnet and deformation of the collar the yieldable collar being spaced from the self-sealing cap a distance just greater than the length of the magnet along the capillary tube.

4,441,511

PNEUMATIC MATERIAL HANDLING SYSTEM FOR COMBINES

Douglas K. Schroeder, Rte. 1, Estherville, Iowa 51334

Filed Mar. 22, 1982, Ser. No. 360,611
Int. Cl.³ A01F *12/44*
U.S. Cl. 130—27 Z **2 Claims**



1. In a self-propelled combine of the type including a header, a feed mechanism for feeding crops into the combine, a threshing cylinder for separating grain crops and the like, chaff and straw, straw-walkers for removing straw from the combine, a chaffer sieve for receiving chaff and straw from the cylinder, a clean grain sieve positioned below the chaffer sieve for separating grain from chaff, a cleaning fan for directing air through the sieves to facilitate separation of the grain from the chaff, a grain tank in which grain is collected;

the improvement comprising an elongate clean grain collection tube extending transversely of the combine below the chaffer and clean grain sieves for receiving clean grain therein, said clean grain collection tube having an inlet and an outlet;

a fan for producing a stream of air, a conduit interconnecting said fan with the inlet of said clean grain collection tube for supplying air under pressure to the clean-grain collection tube;

a cyclone structure on said combine and communicating with a grain tank, conduit means interconnecting the outlet of said clean grain collection tube with said cyclone whereby grain in the clean grain collection tube will be entrained in a stream of air and directed to said cyclone to permit grain to be discharged into the grain tank;

an airlock device including an elongate housing positioned above said clean grain collection tube and having an elongate outlet therein communicating with the clean grain collection tube, said housing having an inlet therein for receiving clean grain therethrough;

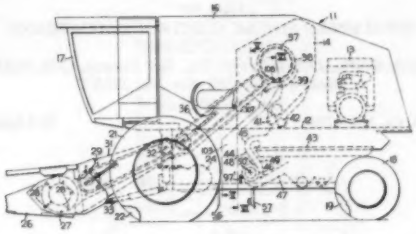
said airlock device including an elongate driven airlock mechanism positioned in the associated airlock housing and being revolvable relative thereto, said airlock mechanism including a shaft having a plurality of blades secured thereto and extending outwardly therefrom, each blade having a tip portion engaging the innner surface of the associated housing during rotation of the blade to form an airseal thereat, said airlock mechanism being operable to meter a predetermined amount of clean grain into the clean grain collection tube while preventing air under pressure from escaping from the clean grain tube.

4,441,512

COMBINED AIR INTAKE SCREEN AND ACCESS DOOR FOR COMBINE

Garry W. Busboom, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 29, 1982, Ser. No. 362,831
Int. Cl.³ A01F *12/48*
U.S. Cl. 130—27 Z **4 Claims**



1. In a harvester including a main frame with laterally spaced vertical side walls, a pair of drive wheels and associated change speed transmission on the forward end of the main frame, a pair of steerable wheels in supporting relation to the rear end of the main frame, a transverse header, a feeder operatively interconnecting the header and the front of the main frame and including a crop conveying means, a crop processor at an elevated position on said main frame and including a processor housing, a conveyor disposed above the transmission operable to move crop material from the crop conveying means to the crop processor, and a transverse fan and duct walls spaced rearwardly of said transmission and below the conveyor and processor with the fan disposed between and rotatably supported on the side walls for rotation about a transverse horizontal axis, the side walls, conveyor, processor housing, transverse fan and ductwork defining an interior air passageway and service cavity, the improvement comprising:

a combined intake air screen and access means to the interior cavity including

a pair of downwardly swingable foraminous doors disposed in side-by-side relation to one another in their closed positions wherein they are substantially horizontally coplanar, said doors being pivotally connected to the main frame on longitudinally spaced transverse axes for vertical swinging movement between their horizontal closed positions to downwardly extending vertical open positions, and

manually operable releasable retaining means operable to hold said doors in their closed positions, said doors swinging downwardly when said retaining means is released thereby exposing a bottom opening for human access to said cavity for inspection and servicing of components accessible from within said cavity.

4,441,513

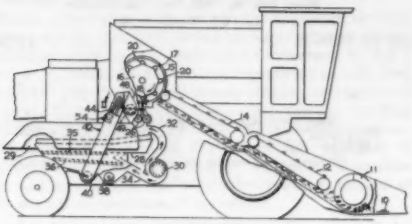
TAILINGS MONITOR FOR COMBINE HARVESTER

Warren E. Herwig, Wind Lake, Wis., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Jul. 30, 1982, Ser. No. 403,785
Int. Cl.³ A01F *12/00*; G01N *21/85*
U.S. Cl. 130—27 B **9 Claims**

1. In a combine harvester vehicle having crop cutting means and threshing and separating stages operative to separate the grain from the other crop material and a cleaning stage operative to substantially remove chaff and the like from the grain received from the threshing and separating stages and including a tailings portion operative to separate incompletely threshed and separated tailings from the grain, said harvester vehicle also having a tailings return elevator for conveying said tailings from said tailings portion to one of said stages for

recycling, the improvement comprising means for transmitting a radiant energy beam internally of said elevator transversely across the path of said tailings being conveyed in said elevator,



and means for providing a visual indication proportional to the percentage of time that said beam is interrupted by said tailings being conveyed in said elevator, said last mentioned means including a detector in the path of said beam.

4,441,514

SMOKE FLAVOR ENHANCING AGENTS

Terence G. Mitchell, Romsey; Adrian G. Barnes, Fareham; Julia S. Jackson, and Peter C. Bevan, both of Southampton, all of England, assignors to British-American Tobacco Co., Ltd., London, England

Filed Jan. 12, 1982, Ser. No. 338,897

Claims priority, application United Kingdom, Jan. 19, 1981, 8101536

Int. Cl.³ A24B *3/12, 15/30*

U.S. Cl. 131—276 **10 Claims**

1. A method for enhancing the smoke flavour of a smoking material which comprises incorporating with the material a product comprising 3-hydroxysclareol.

4,441,515

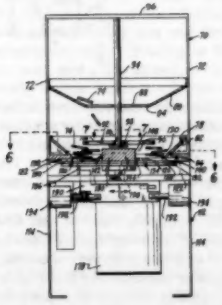
GAMING DEVICE INCLUDING COIN DISPENSING MEANS

Siegfried E. Goepner, Carson City, Nev., assignor to Chance Manufacturing, Inc., Las Vegas, Nev.

Filed Jul. 10, 1981, Ser. No. 282,260

Int. Cl.³ G07D *9/04*

U.S. Cl. 133—5 R **42 Claims**



1. A coin dispensing device for dispensing coins of a predetermined width and thickness, said device comprising:

a hopper for storing a supply of coins to be dispensed, said hopper including bottom guide means for guiding of coins through the bottom of said hopper, said guide means including a lower edge portion defining a circular opening through which coins are to be guided, said circular opening being of a first predetermined diameter;

a rotatable feed disc arranged beneath said guide means for rotation about an axis substantially coinciding with the axis of said circular opening of said guide means, said feed disc including a circular hub element coaxially arranged with the axis of rotation of said feed disc and extending above the upper surface of said feed disc, said circular hub element being of a second predetermined diameter which is less than said first predetermined diameter by an amount which is approximately twice said predetermined width of said coins to be dispensed so as to define with said lower edge portion of said guide means an annular space above said feed disc for the receipt of coins to be dispensed, said upper surface of said feed disc being spaced from the lower surface of said lower edge portion of said guide means a distance which is less than twice said predetermined thickness of said coins to be dispensed, and said guide means and said feed disc defining a substantially annular coin passageway therebetween which is disposed radially outward from and around said annular space and into which coins supported by said feed disc in said annular space may pass beneath said lower edge portion of said guide means;

agitating and support means arranged in said hopper for supporting coins in said hopper above said agitating and support means and for directing coins in said hopper downwardly past said agitating and support means towards said annular space so as to be placed onto said feed disc;

means for rotating said feed disc to urge coins thereon in said annular space radially outward beneath said guide means into said coin passageway; and

closure means associated with said guide means and said feed disc for substantially enclosing the outer periphery of said substantially annular coin passageway between said feed disc and said guide means, said closure means including a lateral outlet slot communicating with said coin passageway through which coins in said coin passageway are directed upon rotation of said feed disc.

4,441,516

DEVICE FOR COUNTING COINS

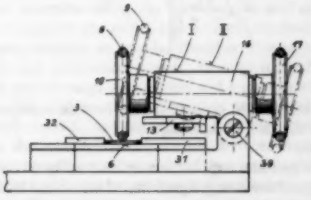
Werner Stadler, Bruchsal, and Bernd Petri, Oftersheim, both of Fed. Rep. of Germany, assignors to Standardwerk Eugen Reis GmbH, Bruchsal, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,495

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048561

Int. Cl.³ G07D *9/04*

U.S. Cl. 133—8 A **5 Claims**



1. In a coin counting machine having a centrifugal disc surrounded by a circular wall a portion of which is vertically movable to define a slot through which individual coins are permitted to pass into a passageway on to a counter, at least one side of said passageway being movable relative to the other side, adjusting means for simultaneously positioning the movable portion of the vertical containing wall and the side of passageway in accordance with the thickness and diameter of the coins, and an endless belt arranged above said passageway driven to transport said coins through the passageway, the improvement wherein said belt is mounted to a support swingable about a pivot axis extending parallel to its length and laterally offset therefrom, and said adjusting means includes

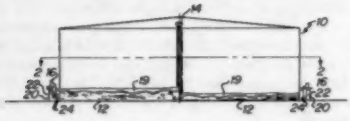
means for simultaneously positioning the belt to depend on the coins in said passageway with a constant pressure regardless of the diameter or thickness of the coins.

4,441,517

APPARATUS FOR SONICALLY FACILITATING THE CLEANING OF OIL STORAGE AND TRANSPORT VESSELS

Edward H. Phillips, Middletown, Calif., assignor to Hidden Valley Associates, Middletown, Calif.

Filed Aug. 13, 1982, Ser. No. 408,053
Int. Cl.³ B08B 3/12
U.S. Cl. 134—113 **9 Claims**



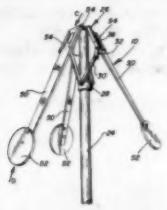
1. Apparatus for directing sonic energy into a vessel, said apparatus comprising:
   - sonic transducer means, disposed outside the vessel, for directing one or more beams of sonic energy into the vessel; and
   - scan control means, coupled to the sonic transducer means, for scanning said one or more beams of sonic energy to cyclically irradiate nongaseous materials in the vessel.

4,441,518

COLLAPSIBLE SUPPORT FIXTURE FOR CAMOUFLAGE SCREENS OR THE LIKE

Mark J. Hogan, Lake Helen, and Ernest R. Cooke, Deltona, both of Fla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Mar. 26, 1982, Ser. No. 362,318
Int. Cl.³ A45F 1/16
U.S. Cl. 135—98 **23 Claims**



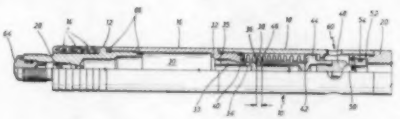
1. A collapsible support fixture for camouflage screen systems or the like, comprising:
   - a shaft;
   - batten spreader support means for readily releasably receiving and mounting a plurality of individual batten spreader support arms for supporting said camouflage screen, said support means being fixed to said shaft for pivotal movement relative thereto between a collapsed position generally alongside said shaft and a spread position generally radially of said shaft;
   - slide means slidable on said shaft;
   - link means connecting said slide means to said batten spreader support means for moving said batten spreader support means between said positions in response to sliding movement of said slide means on said shaft; and
   - over-center means to hold said batten spreader support means in said spread position automatically when said slide means reaches a predetermined position along said shaft.

4,441,519

GAS LIFT VALVE AND METHOD OF PRESETTING

Ben D. Terral, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,811
Int. Cl.³ F04F 1/20
U.S. Cl. 137—15 **11 Claims**



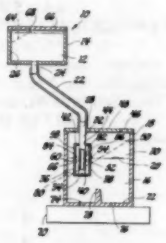
1. A method of presetting a bellows-type gas lift valve having a valve stem coupled to a bellows and operable upon retraction of the bellows to open a flow orifice in response to applied operating pressure, comprising the steps of:
   - limiting the travel of said valve stem to a first distance sufficient to permanently partially retract the bellows;
   - causing said valve stem to travel said first distance; and
   - subsequently limiting the travel of said valve stem to a second distance which is less than said first distance, said second distance being such that said valve stem will travel said second distance upon application of a predetermined normal operating pressure.

4,441,520

HYDRAULIC FLUID RESERVOIR SYSTEM

Frederick G. Bruso, Hartland; Frank H. Walker, Grand Blanc, and Harry H. Lyon, Farmington Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1982, Ser. No. 412,135
Int. Cl.³ G05D 9/02
U.S. Cl. 137—44 **3 Claims**



1. In a hydraulic fluid reservoir system for a hydraulic device such as a vehicle master cylinder adapted for operation at various vehicle attitudes with a condition of vehicle movement either steady, accelerating or decelerating, said system having a sealed first reservoir, a vented second reservoir in gravity flow communication with said first reservoir so that under certain conditions hydraulic fluid in said first reservoir may flow into said second reservoir and air from said second reservoir may flow to said first reservoir, a conduit extending into said second reservoir substantially fixed with respect thereto and having an opening located at a predetermined level of hydraulic fluid in said second reservoir when the condition of vehicle movement is steady sufficient to provide satisfactory operation of said hydraulic device at all vehicle operational attitudes and conditions of vehicle movement, the improvement comprising:
   - a shroud around said conduit at said opening and defining with said conduit a fluid chamber into which said opening opens at said predetermined level, said shroud having a vent at the upper part thereof venting said chamber into said second reservoir and an aperture substantially in a horizontal plane

with said opening at a level one of said various vehicle attitudes but spaced from said opening, said aperture providing communication between said chamber and said second reservoir for hydraulic fluid or air in accordance with vehicle attitude and condition of movement;

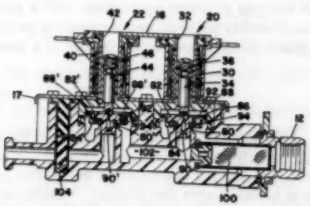
said shroud cooperating with said conduit to prevent air from entering said conduit through said opening during all vehicle operational attitudes and conditions of movement so that a level of hydraulic fluid is always maintained in said fluid chambers in blocking relation to said opening irrespective of the level of hydraulic fluid in said second reservoir resulting from the attitude of the vehicle or its condition of movement, whereby to prevent the unnecessary depletion of hydraulic fluid in said first reservoir by reason of air flow from said second reservoir to said first reservoir because of such attitude or condition of movement.

4,441,521

APPLIANCE CONTROL VALVE ASSEMBLY WITH OPPOSITE MAGNETIC POLARITY SOLENOID COILS

Wade R. Brown, Saint Charles, and Thomas N. Gumble, Bartlett, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 13, 1981, Ser. No. 263,215
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—613 **14 Claims**



1. A solenoid actuated valve assembly for use in electrical applicances, the valve assembly comprising:

a valve housing including a first ferromagnetic member, a second ferromagnetic member, at least one inlet port and at least one outlet port;

a first solenoid actuated, pilot operated flow control valve including a first solenoid coil disposed in the valve housing mounted between the first and second ferromagnetic members in magnetic communication therewith, a first valve seat and a first valve closure which selectively permit and prohibit the flow of fluid through the first flow control valve, the first valve seat and first valve closure being disposed in the valve housing in fluid connection with the inlet port, and a first armature movably disposed at least partially within the first solenoid coil and operatively connected with the first valve closure such that movement of the first armature causes the first valve seat and first valve closure selectively to permit and prohibit fluid flow;

a second solenoid actuated flow control valve including a second solenoid coil disposed in the valve housing mounted between the first and second ferromagnetic members in magnetic communication therewith, a second valve seat and a second valve closure which selectively permit and prohibit the flow of fluid through the second flow control valve, the second valve seat and second valve closure being disposed in the valve housing in fluid connection with the outlet port and, a second armature movably disposed at least partially within the second solenoid coil and operatively connected with the second valve closure such that movement of the second armature causes the second valve seat and closure selectively to permit and prohibit fluid flow, the second solenoid coil being disposed in sufficiently close proximity to the first solenoid coil that a magnetic flux path is formed through the first and second solenoid coils with sufficient strength to reduce electrical impedance of the first and second solenoid coils; and,

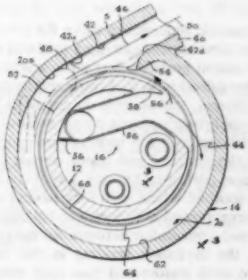
connecting means for connecting an actuating potential to the first and second solenoid coils in such a manner that the first solenoid coil and the second solenoid coil generate magnetic fields which are 180° out of phase.

4,441,522

PIGGABLE MULTICHAMBER FLUID SWIVEL

Michael D. Griffin, Mission Hills, Calif., assignor to Amtel, Inc., Providence, R.I.

Filed Nov. 7, 1980, Ser. No. 204,801
Int. Cl.³ F16L *27/06*
U.S. Cl. 137—615 **10 Claims**



1. In an offshore installation which includes a rotatable vessel mooring device which moors a vessel while allowing drifting of the vessel under the influence of winds, currents and waves including prevailing winds and currents, and where fluid cargo can be transferred between an undersea conduit and a moored vessel through a fluid swivel that includes a nonrotatable part connected to the undersea conduit and a rotatable part rotatable about the nonrotatable part and connected by a conduit to the vessel, and wherein the fluid swivel is piggable and includes an annular chamber formed between the rotatable and nonrotatable parts, an inlet formed in the nonrotatable part through which fluid and a pig can enter the annular chamber and an outlet formed in the rotatable part through which the fluid and pig can exit the annular chamber, and wherein the rotatable part has a pig diverter means at or near the outlet to assure the entrance of the pig into the outlet, but with the diverter means extending into and at least partially blocking the annular chamber so that the diverter means can prevent a pigging operation when the rotatable part is oriented so the inlet and outlet are slightly past a position of alignment, the improvement wherein:

means maintaining said rotatable fluid swivel part outlet oriented with respect to said mooring device and said nonrotatable fluid swivel part inlet so that the outlet axis lies substantially aligned with the inlet axis when the vessel lies at the least likely position which it would assume under the combined influence of prevailing winds and currents such that said pig entering said inlet will not directly encounter said diverter means and be blocked from exiting said outlet.

4,441,523

SEQUENCING VALVE

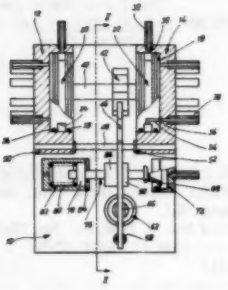
Kurt Stoll, Lenzhalde 72, D-7300 Esslingen a.N., Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 403,166

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130291

Int. Cl.³ F16K *11/02*

U.S. Cl. 137—624.18 **9 Claims**



1. In a pneumatic sequencing valve for producing connections one at the time between an input port and any desired one of a group of output ports, having a rotor with an output port therein, a stator joined with said rotor and having a number of output ports therein, said stator's output ports being on a line traced out by said rotor's output port if said rotor is turned, an intermittent driving unit for turning said rotor in half steps equal to half the pitch of said stator output ports, a driving toothed wheel as part of said motor, a rocking driving fork for stepping said toothed wheel, said fork having an axis of rocking and fork arms placed at different radial distances from said rocking axis, and a pneumatic actuator for moving said rocking driving fork, the invention residing in that said sequencing valve has two such stators and two such rotors, said rotors being so ganged with their output ports at an angle about the axis of said rotors that when one rotor output port is lined up with one stator output port, the output port of said other rotor is between two stator output ports, said sequencing valve furthermore having parts for mechanically locking said driving fork of said intermittent driving unit in all half-step positions thereof.

4,441,524

BALL VALVE

Hisayoshi Mese, Osaka, Japan, assignor to Fuji Kinzoku Kohsaku Co. Ltd., Osaka, Japan

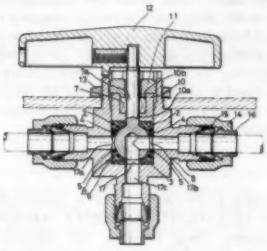
Filed Sep. 25, 1981, Ser. No. 305,851

Claims priority, application Japan, Oct. 2, 1980, 55-138576

Int. Cl.³ F16K *5/06*

U.S. Cl. 137—625.47 **3 Claims**

1. A ball valve comprising a valve seat assembly locatable within a valve box, the latter being provided with at least two fluid passages and with a valve chamber open at one end, the valve seat assembly comprising a rod-carrying ball provided with a through-hole for enabling communication between said passages, characterized by a lower valve seat having a concave surface for slidable contact with a lower portion of the ball and formed with semicircular packing insertion apertures on opposed upper side surfaces, an upper valve seat into which the rod is inserted to be assembled, the upper valve seat having a concave surface for slidable contact with an upper portion of the ball and formed with semicircular packing insertion apertures on opposed lower side surfaces, packings each being locatable in an opening formed by packing insertion apertures when the valve seats are assembled, and having a concave front surface for slidable contact with the ball as well as a convex rear surface for slidable contact with an outer peripheral surface of the valve chamber, and annular retainers locatable in retainer insertion holes of packings and each having a front concave surface for slidable contact with the ball as well as a convex rear surface for slidable contact with the outer peripheral surface of the valve chamber, the annular retainers being made of a harder material than the packings and the



retainers together with the valve box, the upper and lower valve seats and the ball totally encasing the packings, the valve rod passing through the upper valve seat to bring an upper surface of the seat into butting relation with a packing gland fitted with a bearing packing, and the bearing packing and the packing gland being tightened by means of a packing gland screw.

4,441,525

FLUIDIC STABILIZATION CONTROL

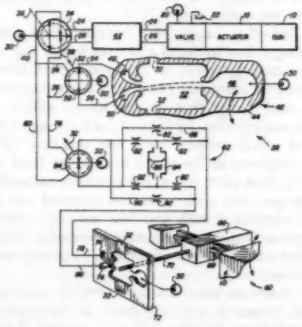
Thomas B. Tippetts, Mesa, Ariz., and Francis M. Manion, Rockville, Md., assignors to The Garrett Corporation, Los Angeles, Calif. and United States Government, Washington, D.C.

Division of Ser. No. 967,812, Dec. 8, 1978, Pat. No. 4,256,015.

This application Jul. 24, 1980, Ser. No. 171,764

Int. Cl.³ F15C *1/12, 3/00*

U.S. Cl. 137—814 **9 Claims**



1. A circuit for adjusting the phase of a fluid pressure differential signal carried in first and second conduits, comprising:

first means, including feed forward circuit means in communication with said first and second conduits, and further including passive flow capacitive and flow resistance means in communication with said first and second conduits, for providing a transfer function for said signal of the form

$$\frac{1-\tau S}{1+\tau S},$$

where $\tau 0$ is the time constant of said circuit and S is the La-

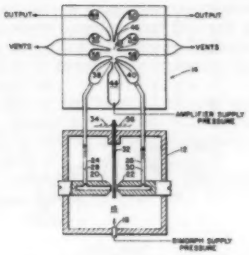
place Transform operator, whereby said first means adjusts the phase of said signal in relation to the frequency of said signal without causing the gain of said signal to be dependent upon said frequency.

4,441,526

ANALOG ELECTRO-FLUIDIC SIGNAL TRANSDUCER

Charles K. Taft, 25 Woodridge Rd., Durham, N.H. 03824, and Benjamin M. Herrick, 23 Davis Rd., Apt. C3, Acton, Mass. 01720

Filed Nov. 16, 1981, Ser. No. 322,004
Int. Cl.³ F15C *1/04, 1/14, 1/06*
U.S. Cl. 137—831 **10 Claims**



1. An analog electro-fluidic signal transducer comprising, in combination,

a housing defining a first chamber adapted for connection to a first source of fluid pressure, a pair of input passages each having at one end thereof a nozzle open to said chamber, the nozzles being mutually opposed and a predetermined space within said first chamber separating said nozzles, a cantilever mounted piezoelectric bender having a portion thereof located in said predetermined space between the nozzles, said bender being bendable to move said portion toward and away from said nozzles respectively and means for connecting the bender to a voltage source, and

a laminar proportional amplifier defining a second chamber, means adapted for connection to a second source of fluid pressure and for directing a laminar jet into the second chamber, a pair of inlets on opposing sides of the jet and connected to said input passages, and a pair of output passages diverging from a flow divider in the path of the jet and downstream of said inlets.

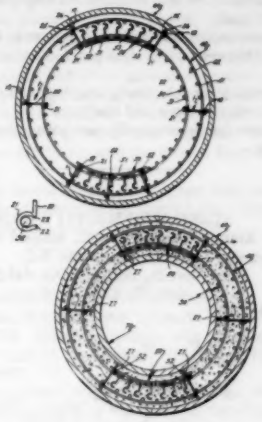
4,441,527

CONCRETE PIPE REINFORCEMENT SPACER BAR

Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

Division of Ser. No. 56,592, Jul. 11, 1979, Pat. No. 4,270,583. This application May 27, 1981, Ser. No. 267,557
Int. Cl.³ F16L *55/00*
U.S. Cl. 138—175 **1 Claim**

1. A cage assembly of inner and outer, generally cylindrical pipe reinforcing cages, each cage including a plurality of longitudinal wire strands joined to a plurality of circumferential wire strands, said assembly comprising: a plurality of spacer bars each having a tie rod and a plurality of links joined to and spaced along the length of said tie rod, said links being generally parallel to one another and each including a hook spaced from said tie rod a distance approximately equal to the desired spacing between said inner and outer cages; each said tie rod engaging one of said inner and outer cages and said links projecting through said one cage toward the other, said hooks hooking over one or more wire strands in said other cage to thereby hold the two cages together; the entrance of said hook having two rounded cam surfaces, one on either side of said entrance of said hook, whereby said wire strand snaps easily into said hook; and a tail hook at one end of said tie rod for hooking over the circumferential wire of one of said cages, said tail hook having an entrance narrower than the circumferential



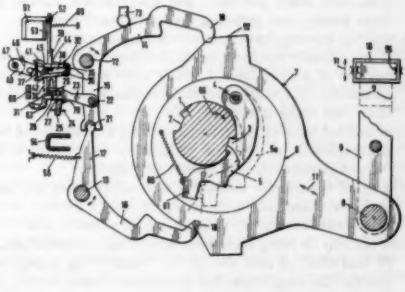
strand which it hooks over whereby a snap fit therebetween is effected.

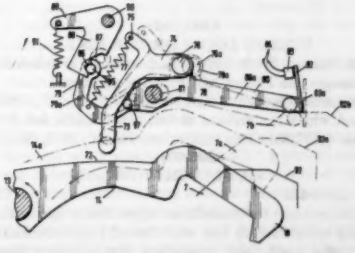
4,441,528

CLUTCH ARRANGEMENT FOR CONTROLLING THE HEDDLES OF A WEAVING MACHINE

Werner Julich, Wallisellen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 16, 1982, Ser. No. 450,438
Claims priority, application European Pat. Off., Dec. 28, 1981, 81 810517.3
Int. Cl.³ D03C *1/00;* **D03D** *51/46*
U.S. Cl. 139—66 R **16 Claims**





1. A clutch arrangement for controlling a heddle of a weaving machine, said arrangement comprising

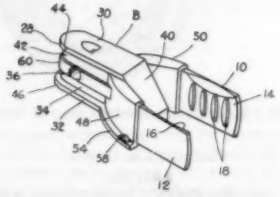
an intermittently rotatable drive shaft having at least one slot therein;
an eccentric rotatably mounted on said shaft;
a pawl mounted on said eccentric for engagement in said slot of said shaft;
first means connected with said eccentric for moving the heddle between a low shed position and a high shed position;
second means for selectively coupling and uncoupling said pawl with and from said shaft; and
third means for automatically monitoring the position of the heddle.

4,441,529

STABILIZED SHUTTLE GRIP

Charles F. Kramer, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed Nov. 29, 1982, Ser. No. 445,356
Int. Cl.³ D03J *5/16*
U.S. Cl. 139—207 **11 Claims**



1. An encapsulated shuttle grip for use in a shuttle for holding a bobbin in a properly aligned position during weaving, said shuttle having a shelf cut formed therein in which said shuttle grip is received for attachment to said shuttle by means of an attachment bolt, said shelf cut having a side under cut groove formed in a side wall of said shuttle, said shuttle grip comprising:
a pair of opposed rigid leaves having spaced apart gripping jaws, end shank portions, and intermediate curved portions joining said gripping jaws and shank portions;
a molded housing having a forward nose portion;
said end shank portions being encapsulated in said nose portion of said molded housing with said gripping jaws extending outwardly from said molded housing being free from said molded housing; and
said molded housing including arcuately extended side walls encapsulating at least a portion of said intermediate curved portions of said shuttle grip leaves;
a molded bottom rib extending outwardly from said arcuately extended side walls along at least a portion of said side walls rearwardly from said nose portion; and
said bottom rib being receivable in said side undercut groove of said shelf of said shuttle for interlocking engagement therein resisting rotational movement of said shuttle grip about said attachment bolt.

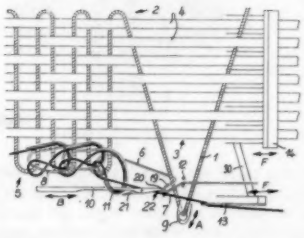
4,441,530

RIBBON LOOM OR THE LIKE

Robert R. Bucher, Frick, Switzerland, assignor to Jakob Müller Forschungs- und Finanz AG, Frick, Switzerland

Continuation-in-part of Ser. No. 70,116, Aug. 27, 1980, abandoned, which is a division of Ser. No. 812,861, Jul. 5, 1977, Pat. No. 4,202,381. This application Jul. 20, 1981, Ser. No. 285,400
Int. Cl.³ D03D *47/44*
U.S. Cl. 139—432 **3 Claims**

1. A ribbon loom for manufacturing a ribbon tape or the like containing warp threads and weft thread loops inserted from one side of a warp shed, wherein a first auxiliary thread is drawn through the weft thread loops and a second auxiliary thread disposed outside of the weft thread loops is knitted with each n-th stitch of the first auxiliary thread in order to secure the same, said ribbon loom comprising:
a weft thread insertion element;
a knitting needle for tying the weft thread loops by means of at least one auxiliary thread;
a thread guide for the second auxiliary thread constructed such that for knitting the second auxiliary thread it inserts such second auxiliary thread into said knitting needle, after the knitting needle has drawn a loop of the first auxiliary thread through the weft thread loop;
wherein the thread guide of the second auxiliary thread is constructed such thread, with respect to a reference plane defined by the knitting needle and the ribbon tape to be



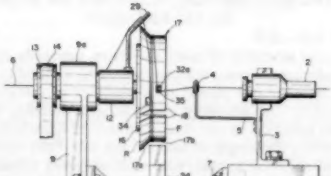
produced, for the insertion into the knitting needle at one side of the reference plane and during the start of a forward stroke of the knitting needle at the other side of the reference plane;
further including a reed, the thread guide of the second auxiliary thread being connected with the reed, said thread guide possessing a guide member which in a beat-up position of the reed is located at the side of the reference plane where there is guided the second auxiliary thread during the start of the forward stroke of the knitting needle;
wherein said guide member comprises a lengthwise guide; and
wherein the lengthwise guide possesses a guide slot.

4,441,531

WEFT DETAINING DEVICE OF SHUTTLELESS LOOM

Hidetsugu Umezawa, Higashiyamato; Takashi Ogasawara, Tokyo, and Haruo Shimazaki, Tachikawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 15, 1981, Ser. No. 283,688
Claims priority, application Japan, Jul. 21, 1980, 55-98649; Sep. 9, 1980, 55-123998
Int. Cl.³ D03D *47/36*
U.S. Cl. 139—452 **28 Claims**



1. A weft detaining device of a shuttleless loom having a weft picking means, comprising:
a drum on which a weft yarn is wound a predetermined

number of times prior to a weft picking through the weft picking means, said drum being constituted by a plurality of separate and independent drum pieces, the peripheral surface of each separate drum piece forming part of the peripheral surface of said drum;

stop means for maintaining said drum in a stationary state;

a support member on which each separate drum piece is securely supportable;

means defining first and second holes on the peripheral surface of said drum, said first and second holes being spaced from each other in the axial direction of said drum;

first and second hook levers formed respectively with hook sections, said first and second hook levers being constructed and arranged such that their hook sections are projectable respectively into said first and second holes to catch the weft yarn on the peripheral surface of said drum;

operating means for operating said first and second hook levers so as to project their respective hook sections at predetermined times in timed relation to an operational cycle of the loom;

means for allowing the locations of said separate drum pieces to be moved independently of each other relative to said support member so as to adjust the outer diameter of said drum; and

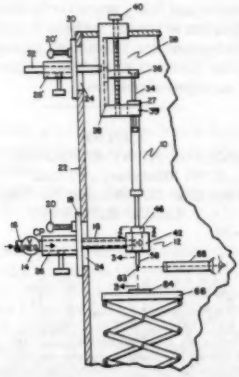
means for releasably fixing said separate drum pieces relative to said support member.

4,441,532

APPARATUS AND METHOD FOR GENERATING SINGLE DROPLETS

Charles F. Hrubesh, Fallston, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 3, 1982, Ser. No. 373,939
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1 **7 Claims**



1. A method for generating single droplets which includes the steps of

selecting the diameter of a stainless steel wire so that it can be hard finger push-fit into a hypodermic needle of known bore to form a generator needle assembly;

grinding the generator needle tip to a point having an included angle of approximately 15 degrees;

assembling the ground generator needle to a hypodermic syringe;

filling the syringe with a liquid to be dispensed from said generator needle;

inserting the plunger of said hypodermic syringe into support means which provides adjustable horizontal support and calibrated adjustable vertical motion to the plunger;

inserting the generator needle assembly into a pneumatic collet which allows regulated air to flow down the periphery of the generator needle with a minimum of turbulence;

preparing a microscope slide with a coating of magnesium oxide;

positioning the microscope slide so that it is in axial alignment with the longitudinal axis of the generator needle;

adjusting a short focus telescope to be in optical alignment with the pointed end of the generator needle;

advancing the plunger of the syringe while observing the droplet formation at the tip of the generator;

adjusting a constant pressure flow regulator to deliver a desired flow rate to air strip the droplet from the generator;

collecting the droplet on the microscope slide; and

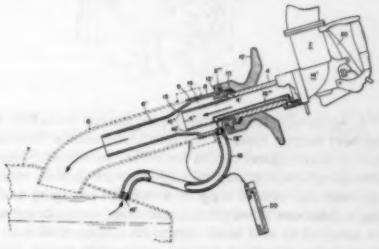
calculating the diameter of the droplet after observing the droplet diameter on the microscope slide.

4,441,533

AUTOMATIC FUEL DISPENSER

George H. Snyder, Box 68-25, Rte. 2, Ozark, Mo. 65721; George H. Snyder, III, 2541 S. Collinson Ave., Springfield, Mo. 65804, and Joseph M. Nusbaumer, 2769 Village Ter., Springfield, Mo. 65807

Continuation-in-part of Ser. No. 966,387, Dec. 4, 1978, abandoned. This application Nov. 3, 1980, Ser. No. 203,228
Int. Cl.³ B65B *31/00*
U.S. Cl. 141—59 **5 Claims**



1. An improved filling system for moving a supply of liquid through an automatic nozzle for dispensing a liquid into a container including valve means, means including an operating lever for opening said valve means. pivotally mounted latch means, vacuum responsive means including a reciprocable member, trip means including a pivotally mounted lever connected to said reciprocable member and pivotally mounted concentrically with said latch means for engaging said latch means upon movement of said vacuum responsive means, means for biasing said latch means into automatic latching engagement with said operating lever upon actuation thereof to an open position, and means including conduit means for creating and supplying a vacuum to said vacuum responsive means for actuating said reciprocable member to trip and release said valve means when the liquid in said container reaches a preselected level, a fill pipe connected to said container, and a hollow adaptor for receiving the nozzle, the improvement comprising:

a nozzle apout having separate liquid dispensing and air removal passages,

said air removal passage being connected at one end to said vacuum responsive means,

said fill pipe adaptor having first end and a second end, said first end being attached to said filler pipe and said second end extending into said filler pipe, said second end having a reduced diameter, and a frusto-conical section between said first end and said second end,

an air conduit connected to said first end of said fill pipe adaptor and to the interior of said container to remove air from said container to the interior of said fill pipe adaptor,

a vacuum chamber between said nozzle spout and said fill

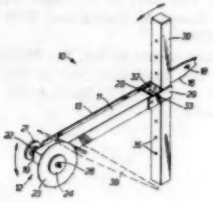
pipe adaptor when said nozzle spout is inserted in said fill pipe adaptor, the length of said nozzle spout being of a length to extend into said frusto-conical section and to provide a narrow space between the end of the nozzle spout and the wall of the frusto-conical section, whereby the velocity of the liquid flowing out of the nozzle spout draws air through said narrow space between the end of said nozzle spout and the wall of said frusto-concial section to create a partial vacuum in said vacuum chamber to supply vacuum to said vacuum responsive means close said valve means.

4,441,534

APPARATUS FOR CUTTING AND/OR GRINDING OF TREE STUMPS

James Wilson, 45 Lucan Ave., Aspley, Queensland, 4034, Australia

Filed Jan. 29, 1982, Ser. No. 343,822
Int. Cl.³ A01G *23/06*
U.S. Cl. 144—2 N **9 Claims**



1. Apparatus for removing tree stumps including elongated support means, toothed circular blade means mounted at one end of said support means for rotary movement about an axis extending transversely of said support means, means at the opposite end of said support means for engaging and supporting a chain saw drive motor, said drive motor being adapted to be coupled to said blade means to cause rotation thereof and there being provided ground engageable means intermediate the ends of said elongated support means, said ground engageable means supporting said elongated support means for pivotal movement about an axis extending transversely of said support means and said elongated support means being substantially balanced in use about said axis, said ground engageable means and said chain saw drive motor being adapted to be manually gripped by an operator to permit selective manipulation of said blade means towards and away from a stump to be removed.

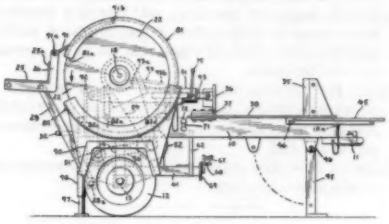
4,441,535

MOBILE LOG SAWING AND SPLITTING MACHINE

John W. Flinn, Brampton; James D. Johnson, and Ward L. Stiemert, both of Escanaba, all of Mich., assignors to Gafner Machine, Inc., Escanaba, Mich.

Filed Mar. 29, 1983, Ser. No. 479,875
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—3 K **12 Claims**

1. A mobile log sawing and splitting machine comprising a trailer frame including an elongated lengthwise extending beam having a vehicle engaging hitch at its forward end and a pair of ground engaging wheels mounted at relatively opposite sides of the beam adjacent the rear end of the trailer frame, a saw mandrel mounted on the trailer frame adjacent its rear end for rotation about a horizontal axis transverse to and spaced above the beam, a circular saw blade mounted on the mandrel and spaced from one side of the beam, an elongated horizontal log support extending crosswise of the trailer frame at the rear end thereof and mounted for movement between a rear position adjacent the rear side of the saw blade and a forward position adjacent the mandrel, a log splitting wedge mounted on the beam adjacent its forward end and a log pusher mounted for sliding movement lengthwise of the beam, a hydraulic ram including a cylinder extending lengthwise of the beam below the mandrel and a piston rod extending from the cylinder and connected to the log pusher for moving it toward and away from the wedge, hydraulic power means including a hydraulic pump and a hydraulic fluid reservoir and a control valve for reversibly supplying hydraulic fluid to the ram, the hydraulic pump being mounted on the trailer frame adjacent its rear end, an internal combustion engine, engine mounting means mounting the engine on the trailer frame at a location forwardly of the mandrel and hydraulic pump, the engine mounting means including an engine support frame and an engine mounting pad mounted on the support frame for sliding



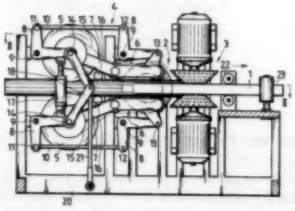
movement along an adjustment path having at least a substantial component lengthwise of the trailer frame, a first belt drive means connecting the engine to the saw mandrel and a second belt drive means connecting the engine to the hydraulic pump, screw means engaging the engine support frame and engine mounting pad for adjustably moving the engine mounting pad relative to the engine support frame, the screw means being operative in response to turning in one direction to release belt tension in the first and second belt drive means to facilitate starting the engine and being operative in response to turning in the other direction to tension the belts in the first and second belt drives, and means for selectively locking the screw in different anglular positions to lock the engine mounting pad and engine in an adjusted position.

4,441,536

MACHINE FOR HEWING SQUARE TIMBERS

Kauko Rautio, 52799 Mäntyharju, Finland

Filed Dec. 24, 1980, Ser. No. 220,249
Int. Cl.³ B27C *9/00*
U.S. Cl. 144—39 **10 Claims**



1. A machine for hewing straight squared timbers from round trunks using rotary cutters and guiding rollers for guiding the trunk being hewn, wherein the machine comprises:

(a) a main frame of the machine;

(b) two rotary cutter pairs disposed immediately after each other with their axes forming with each other an angle of about 90°, said cutters being structurally and rotatably attached to said main frame of the machine, so that round

trunks fed through the cutters are hewn to form squared timber; and

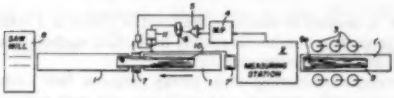
(c) a set of trunk guiding rollers located before said cutter pairs and structurally attached to said main frame, said guiding rollers being centered relative to the trunk and being defined by at least one pair of pulling wheels each having padded circumference, with one pulling wheel being located above and one pulling wheel located below the trunk being hewn, and a pair of track-like pulling roller units, with one roller unit being located above and one roller unit being located below the trunk being hewn, each said roller unit comprising two rollers connected together by an endless track, said pulling roller units being disposed after said pulling wheels but before said cutter pairs, and means structurally interconnecting said pulling wheels and said pulling roller units so that said pulling wheels and pulling roller units all move together parallel to each other and in a transverse direction relative to the trunk being hewn, so that said pulling wheels and pulling roller units follow the thickness of the trunk being hewn, thereby feeding and guiding the trunk forwardly without changing its direction through said cutter pairs to produce straight hewn squared timbers.

4,441,537

APPARATUS AND METHOD FOR ALIGNING LUMBER

Jorma Vartiainen, Karhula, Finland, assignor to Plan-Sell Oy, Finland

Filed Nov. 12, 1981, Ser. No. 320,701
Claims priority, application Finland, Nov. 14, 1980, 80/3564
Int. Cl.³ B27B *1/00*
U.S. Cl. 144—357 **6 Claims**



1. A method for aligning lumber block from which a first pair of cants has been removed to leave upper and lower flat surfaces, comprising:

positioning the block with its lower surface on a longitudinal conveyor for transporting the block in a longitudinal feed direction;

feeding the block past a measuring station in the longitudinal direction which measures the outline of the lower surface and contour of the block to obtain a measurement thereof;

processing the measurement in a microprocessor to obtain a lateral shift amount for an upstream and a downstream end of the block in the longitudinal feed direction by which the block should be shifted to optimize wood production from the block;

laterally shifting the upstream end of the block using a lateral shift conveyor operable in a direction lateral to the longitudinal feed direction to momentarily lift and shift the upstream end by the lateral shift amount for the upstream end;

laterally shifting the downstream end of the block using a lateral shift conveyor operable in a direction lateral of the longitudinal feed direction to momentarily lift and shift the downstream end by the lateral shift amount of the downstream end;

the lateral shifting of the up and downstream ends being spaced in at least one of time, amount and position; and

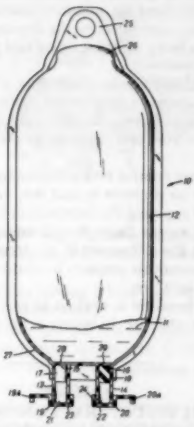
feeding the laterally shifted block in the longitudinal feed direction to a saw mill.

4,441,538

FLEXIBLE CONTAINER WITH INTEGRAL PORTS AND DIAPHRAGM

Mark E. Larkin, Lindenhurst, and Leonard J. Meyer, Antioch, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 106,954, Dec. 26, 1979, Pat. No. 4,313,904.
This application Sep. 3, 1981, Ser. No. 298,987
Int. Cl.³ A61M *5/14*
U.S. Cl. 604—415 **8 Claims**



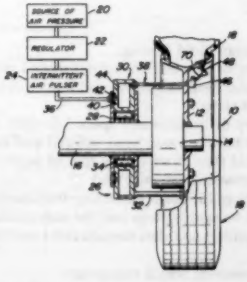
1. A container for liquids comprising a hollow body formed of a plastic material; said hollow body having a plurality of tubular ports integrally formed from said plastic material of said hollow body and extending therefrom; each of said ports having a quantity of said plastic material integrally formed as a diaphragm within said port from said plastic material of said tubular port so as to seal said port.

4,441,539

TIRE PRESSURIZATION CONTROL SYSTEM

David O. Hulse, Exton, Pa., assignor to The Budd Company, Troy, Mich.

Filed Jul. 29, 1982, Ser. No. 402,888
Int. Cl.³ B60C *23/10, 29/00*
U.S. Cl. 152—417 **5 Claims**



1. In a vehicle including a tire mounted to a rotatable wheel about an axle,

a tire pressurization system for maintaining uniform and constant pressure in said tire comprising:

(a) a source of regulated air pressure;

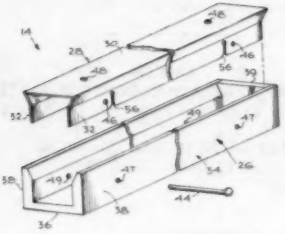
(b) a valve means connected to said wheel for receiving air pressure and applying it to said tire;
(c) means for connecting said regulated air pressure from said source to said valve means, said means for connecting including a member fixedly mounted with respect to said axle, a rotatable member secured to said member connected to rotate with said wheel, and sealing means providing an air chamber to connect air pressure from said fixedly mounted member to said rotatable member; and
(d) air pulsing means connected from said source of regulated air pressure to said means for connecting to apply intermittent air pressure to said means for connecting,
(e) said intermittent air pressure through said air pulsing means being controlled by the amount of added pressure required to bring said tire up to said predetermined pressure level;
(f) said air pulsing means comprising a piston disposed in a housing responsive to pressure from chambers on either side thereof to intermittently connect and disconnect the air pressure from said regulator to said means for connecting;
(g) tire pressure control means connected to said tire responsive to the air pressure in said tire, and
(h) means for applying the intermittent air pressure from said air pulsing means through said means for connecting to respond to the difference in air pressure in said tire and said intermittent air pressure to control the added pressure applied to said tire;
whereby air pressure is applied to said tire only when the pressure in the tire is below a predetermined pressure level.

4,441,540

BOTTOM RAIL STRUCTURAL CONFIGURATION FOR A VENETIAN BLIND

Parker I. Tsuhako, Gardena, Calif., assignor to Ohline Corporation, Gardena, Calif.

Filed Apr. 30, 1982, Ser. No. 373,406
Int. Cl.³ E06B 9/303
U.S. Cl. 160—168 R **10 Claims**



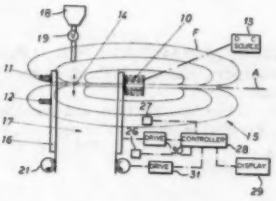
1. In a Venetian blind having:
(a) a plurality of thin horizontally disposed slats;
(b) a horizontal head rail above and a horizontal bottom rail below said slats;
(c) a plurality of horizontally spaced flexible string ladders connected between said head rail and said bottom rail for holding said slats in vertically spaced relation, one above another between said rails; and
(d) a plurality of lift cords extending from said head rail and connected to said bottom rail for movement of said bottom rail, ladders and slats toward and away from said head rail;
the improvement which comprises:
a bottom rail which is an openable box and which contains holding means for individually adjusting the effective lengths of said lift cords and ladder strings, said holding means being concealed from view when the box is closed; and
releasable means for maintaining the box in a closed position, said releasable means being invisible from the front side of the blind;
the bottom rail further comprising:
(e) a generally horizontally extending lower member having a closed bottom and upraised sides; and
(f) a generally horizontally extending upper member with closed top and depending sides;
wherein a plurality of spaced transverse pins releasably extend through aligned openings in said depending sides of the upper member and the upraised rear side of the lower member and into openings in the upraised front side of the lower member which do not extend entirely through said front side, thereby leaving the front face of the bottom rail unblemished.

4,441,541

METHOD OF AND APPARATUS FOR DETERMINING THE MELT LEVEL IN A CONTINUOUS-CASTING MOLD

Franz-Rudolf Block, Roetgen, Fed. Rep. of Germany, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Mar. 11, 1982, Ser. No. 357,275
Claims priority, application Luxembourg, Mar. 18, 1981, 83 224; Aug. 3, 1981, 83 532
Int. Cl.³ B22D 11/16
U.S. Cl. 164—453 **12 Claims**



1. A method of detecting the level of a melt in a vertically reciprocating continuous-casting mold, said method comprising the steps of concurrently:
forming a nonhomogeneous steady magnetic field extending horizontally through said mold into said melt generally at the melt level, said steady field not moving appreciably relative to the mold and generating substantially no eddy currents therein;
vertically reciprocating said field jointly and synchronously with said mold;
detecting the field strength of said field at a sensing location after said field passes through said mold;
vertically reciprocating said location jointly and synchronously with said mold; and
deriving said melt level from the detected field strength.

4,441,542

PROCESS FOR COOLING AND SOLIDIFYING CONTINUOUS OR SEMI-CONTINUOUSLY CAST MATERIAL

Michael J. Pryor, and Peter E. Sevier, both of Woodbridge, Conn., assignors to Olin Corporation, New Haven, Conn.

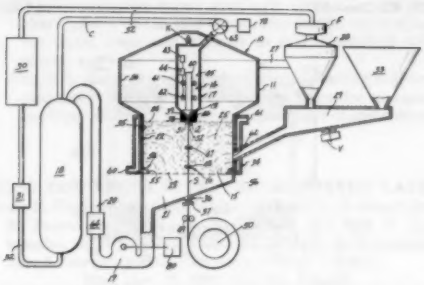
Filed Jun. 10, 1981, Ser. No. 272,131
Int. Cl.³ B22D 11/124
U.S. Cl. 164—485 **10 Claims**

1. A process for casting a molten material comprising:
electromagnetically containing and forming said molten material into a desired casting shape; and
applying a primary coolant to said material to solidify it into said casting, the improvement wherein said primary coolant application step comprises:
applying a fluidized bed of particles to cool said material at a casting zone so that said fluidized bed of particles contacts said material in both the molten and solidified

conditions, said step of applying said fluidized bed of particles comprising:

providing inert particles;

fluidizing said particles with an inert gas flow so that said particles are levitated by said flow of inert gas; and



cooling said fluidized bed of particles to remove heat build up due to the application of said fluidized bed of particles to said material.

4,441,543

METHOD OF ENLARGING WIDTH OF CONTINUOUSLY CAST STRAND

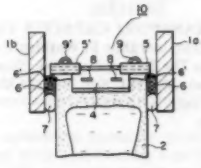
Yutaka Muranaka, Tokuyama, and Haruji Sadahiro, Shinnanyo, both of Japan, assignors to Nisshin Steel Co., Ltd., Japan

Filed Jun. 2, 1981, Ser. No. 269,565

Claims priority, application Japan, Jun. 10, 1980, 55-77111

Int. Cl.³ B22D *11/08*

U.S. Cl. 164—491 **3 Claims**



1. A method of enlarging the width of a continuously cast strand comprising the steps of partially burying a metallic joint having an I-shaped transverse cross-section in the tail end of a cast strand which is in a rectangular mold cavity defined by narrow and wide pairs of mold pieces so that the longitudinal axis of said joint is substantially horizontal and in parallel with walls of the side mold pieces, solidifying the tail end of the strand, outwardly moving the narrow mold pieces to define the desired enlarged width of the strand, filling the so-formed openings between the strand and the walls of the mold pieces with a refractory fibrous material and then with a metallic cushioning material in the form of power, tape, or fiber; re-starting the continuous strand casting process, all the steps being carried out before said tail end of the strand leaves the mold cavity; and said metallic joint is provided on its top face with two metallic plates slidable along its longitudinal axis and wherein said plates are slidably moved on the top face of said joint towards the walls of the narrow mold pieces so that said plates partially extend beyond the longitudinal ends of said joint before the casting process is restarted.

4,441,544

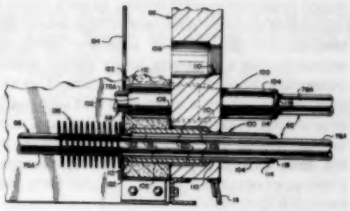
WASTE HEAT RECOVERY SYSTEM HAVING THERMAL SLEEVE SUPPORT FOR HEAT PIPE

Jack McCurley, Dallas, Tex., assignor to Q-dot Corporation, Garland, Tex.

Division of Ser. No. 165,059, Jul. 1, 1980. This application Mar. 4, 1982, Ser. No. 354,745

Int. Cl.³ F28F *9/10*

U.S. Cl. 165—1 **5 Claims**



1. A method for connecting the sealed interior of a boiler tank in thermal communication with a convection heat transfer chamber comprising:

installing a header plate having a heat pipe opening within the sidewall of the boiler tank;

extending the condenser end portion of a heat pipe through the heat pipe opening into the interior of the boiler tank with the evaporator end portion extending into the convection heat transfer chamber;

interposing a thermal support sleeve between the heat pipe and the header plate whereby the heat pipe is supported in radially spaced relation within the thermal sleeve;

connecting the midsection of the thermal support sleeve in sealed engagement with the header plate; and,

connecting an end portion of the thermal sleeve in sealed engagement with the condenser end of the heat pipe.

4,441,545

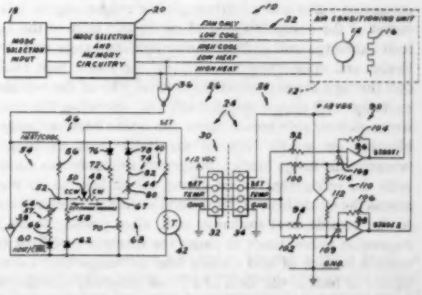
AIR CONDITIONING THERMOSTATIC CONTROL SYSTEM HAVING MODULAR INCLUSION OF REMOTE TEMPERATURE SET-BACK CAPABILITY

Robert P. Alley, Manlius; John W. Relyea, Warners, both of N.Y., and Donald L. Sidebottom, Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jul. 26, 1982, Ser. No. 401,489

Int. Cl.³ G05D *23/00*; H03K *5/153*

U.S. Cl. 165—26 **8 Claims**



1. A thermostatic control system having auxiliary temperature setting capability, said system comprising:

a temperature-responsive source for producing a temperature-dependent voltage as a function of sensed temperature;

a reference voltage source having a relatively higher output impedance and producing a reference voltage for establishing a temperature setting;

a voltage comparator having a comparison input connected to said temperature-responsive source and a reference input connected to said reference voltage source for producing a control output signal for energizing a thermal conditioning element when the temperature-dependent voltage and the reference voltage have at least a predetermined relationship with respect to each other; and

an adjustable auxiliary reference voltage source for auxiliary temperature setting, said auxiliary reference voltage source having a relatively lower output impedance and connected through a switching element to said voltage comparator reference input such that said auxiliary reference voltage source at least partly overrides said reference voltage source when said switching element is conducting, and said auxiliary reference voltage source including a source of command signals in digital form and a digital-to-analog converter.

4,441,546

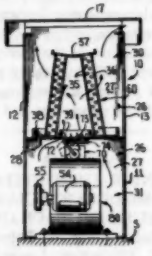
METHOD OF OPERATING A HEAT-AUGMENTED HEAT PUMP SYSTEM

Gerry VanderVaart, Niagara Falls, Can...da, assignor to Kool-Fire Limited, Niagara Falls, Canada

Division of Ser. No. 54,647, Jul. 3, 1979, Pat. No. 4,311,191. This application Apr. 30, 1981, Ser. No. 259,357

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—29 **4 Claims**



1. A method of heating and defrosting in a heat pump system which includes at least an outside heat exchange coil defining a substantially enclosed interior chamber and an open lower end portion, an inside heat exchange coil, a compressor, an expansion valve and a refrigerant line connecting an inlet and outlet of the compressor to an outlet and inlet of the outside heat exchange coil and the inside heat exchange coil, respectively, and connecting an outlet of the inside heat exchange coil through the expansion valve to an inlet of the outside heat exchange coil comprising the steps of; operating the compressor to deliver refrigerant vapor the inside heat exchange coil; blowing air across coils of the inside heat exchange coil whereby the inside heat exchange coil functions as a condenser with the refrigerant vapor giving off its heat to air blowing across the inside heat exchange coil so that refrigerant returned to the outside heat exchange coil, after passing through the expansion valve, tends to cause the formation of frost on the outside surface of said outside heat exchange coil; creating a source of heat in the form of a flame generally contiguous and below the outside heat exchange coil and introducing the flame upwardly and substantially entirely into the interior chamber; and preventing the formation of frost on the outside heat exchange coil solely through the utilization of the created flame and in the absence of reversing the operation of the heat pump system to its cooling mode.

4,441,547

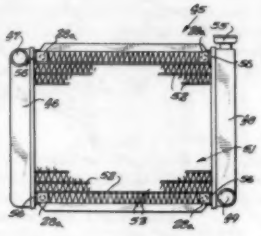
RADIATOR MOUNTING FITTINGS

Charles S. Argyle, Willowdale; Richard P. Beldam, Mississauga, and Robert J. Hope, Oakville, all of Canada, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 5, 1981, Ser. No. 222,414

Int. Cl.³ F28F *9/00*

U.S. Cl. 165—67 **11 Claims**



1. In a heat exchanger having inlet and outlet headers forming inlet and outlet chambers or tanks connected by a heat transfer core including a plurality of generally parallel fluid conduits spaced apart and having generally corrugated heat transfer fins therebetween, some of said fins terminating short of and providing a mounting space adjacent to said headers between adjacent conduits on the air side, and mounting means received in and extending through said mounting space, said mounting means being secured to said fluid conduits, said mounting means consisting of a solid member of a length to extend substantially through the core and of a height substantially equal to the spacing between adjacent conduits, each member having an opening extending axially at least partially therethrough to receive mounting screws or bolts extending from mounting brackets on an article to which the heat exchanger is secured.

4,441,548

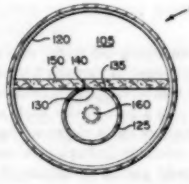
HIGH HEAT TRANSPORT CAPACITY HEAT PIPE

James L. Franklin, Kent, and Dale F. Watkins, Sumner, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1981, Ser. No. 334,856

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—104.26 **8 Claims**



1. An improved heat pipe of increased heat transport capacity, comprising:

a sealed envelope,

a working fluid contained within said envelope; said fluid being capable of undergoing a liquid/vapor phase change,

an evaporator section defined within said envelope for vaporizing said fluid,

a condenser section defined within said envelope for condensing said vaporized fluid, whereby a liquid is formed,

means forming a solid wall artery disposed within said envelope extending between said condenser section and said evaporator section for conducting said liquid by capillary

action from said condenser section to said evaporator section,

a channel formed on the upper surface of said artery; said channel being provided with beveled surfaces,

means forming a liquid conducting wick; said wick means lying along the inner periphery of said envelope and extending within said evaporator and said condenser,

a liquid conducting means abuttingly contacting said beveled surfaces within said evaporator section for conducting liquid from said channel to said evaporator wick means, and

a liquid transporting means abuttingly contacting said beveled surfaces within said condenser section for transporting liquid from said condenser wick means to said channel.

4,441,549

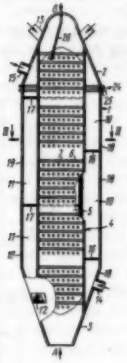
HEAT EXCHANGER WITHIN DENSE GRAVITY LAYER

Boris P. Vasiliev; Nikolai L. Borisov; Mikhail K. Semenov; Ivan K. Ponomarev; Galina B. Tyryshkina, and Igor V. Gorbatenko, all of Belgorod, U.S.S.R., assignors to Belgorodsky Zavod Energeticheskogo Mashinostroenia, U.S.S.R.

Filed Oct. 29, 1981, Ser. No. 316,124

Int. Cl.³ F28F *9/22*

U.S. Cl. 165—145 **14 Claims**



1. A heat exchanger within a dense gravity layer, comprising:

a vertical cylindrical container provided with upper and lower end walls and forming a cavity therewith;

a heating surface mounted inside said container in spaced relation therewith and formed by a tubular housing opened at a lower end, said housing having a perforated surface, and a plurality of tubes mounted in tiers within said housing, said tubes being so disposed that the tubes of one tier are substantially transverse to the tubes of adjacent tiers;

opposite seals mounted between an inner surface of said container and the housing of said heating surface to vertically divide the cavity of said container into two portions;

an inlet for supplying a first heat carrier medium inside the housing of said heating surface, said inlet for supplying said first heat carrier medium being formed by a plurality of branch pipes and a baffle member substantially vertically and equally dividing said plurality of branch pipes, to prevent deflection of the flows of the first heat carrier medium;

a branch pipe for supplying a second heat carrier medium into a space between the inner surface of the container and the housing of said heating surface;

a branch pipe for discharging said second heat carrier medium from the space provided between the inner surface of the container and the housing of said heating surface;

a plurality of substantially horizontal baffle members mounted within the two portions of the cavity of said container in chessboard pattern relative to one another and dividing these portions of the cavity of said container into chambers disposed along the height in chessboard pattern to change the direction of flow of said second heat carrier medium; and

a plurality of support members.

4,441,550

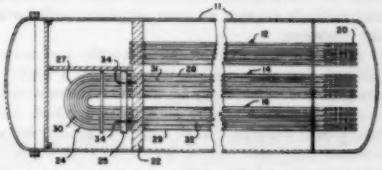
CROSS-OVER BUNDLE FOR HEAT EXCHANGER

A. Timothy Chase, Warren, Pa., assignor to Struthers Wells Corporation, Warren, Pa.

Filed Jan. 14, 1983, Ser. No. 457,978

Int. Cl.³ F28D *7/06*; F28F *9/22*

U.S. Cl. 165—145 **4 Claims**



1. A cross-over bundle for connecting in series the corresponding tubes in adjoining tube side passes in multiple pass shell and tube heat exchangers in which each pass includes a bank of tubes having center-to-center spacing between tubes only slightly greater than the tube diameter, the tubes in each bank terminating in a first tube sheet, comprising a second tube sheet co-extensive with the ends of adjoining tube banks, a plurality of tube U-bends having their ends fixed in said second tube sheet, and fastening means for holding said first and second tube sheets against each other so that the U-bends are positioned to connect each tube end in one bank with its mirror image tube end in the adjoining bank.

4,441,551

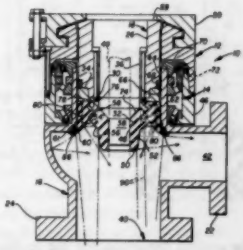
MODIFIED ROTATING HEAD ASSEMBLY FOR ROTATING BLOWOUT PREVENTORS

Morris S. Biffle, 800 W. Front, Midland, Tex. 79761

Filed Oct. 15, 1981, Ser. No. 311,793

Int. Cl.³ E21B *33/06*

U.S. Cl. 166—84 **17 Claims**



1. A rotating blowout preventor having a main body; a lateral outlet leading from said main body, attachment means by which said main body can be connected to the upper end of a wellbore casing; an axial passageway formed through said main body through which a rotating member can be telescopingly received, said lateral passageway is in communication with said axial passageway;

an upwardly extending washpipe affixed to and forming part

of said main body; a rotating head assembly rotatably mounted at the upper end of said main body, said rotating head assembly includes a stripper rubber assembly affixed thereto and positioned within said axial passageway; said stripper rubber assembly includes a stripper mount member and a stripper rubber; an axial passageway formed through said stripper assembly;

said stripper rubber has a large annular upper end attached to said mount member and spaced, concentrically arranged, lower annular marginal ends; said lower annular marginal ends are comprised of an inner annular body and an outer annular body separated from one another by a downwardly opening annular recess; the last said axial passageway is formed through said inner annular body for sealingly receiving a rotating member in a telescoping manner therethrough; said outer annular body has an outer circumferentially extending surface which slidably and sealingly engages an inner peripheral wall surface of the washpipe;

said annular recess includes an upwardly and outwardly inclined first wall portion which forms a lower outer marginal end of said inner annular body, an upwardly and inwardly inclined second wall portion which forms a lower inner marginal end of said outer annular body, and a sloped third wall portion which lies at an obtuse angle respective to said first wall and at an acute angle respective to said second wall and connects said first and second wall portions together;

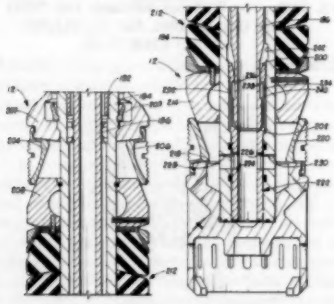
a control sleeve positioned within said outer annular body, said control sleeve is cylindrical in form and concentrically arranged respective to the axial passageway so that reinforcement is provided within the rubber compound to prevent undue distortion of the outer peripheral surface of the outer annular body.

4,441,552

HYDRAULIC SETTING TOOL WITH FLAPPER VALVE

Reed K. Hamman, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 18, 1982, Ser. No. 389,592
Int. Cl.³ E21B *23/00, 34/12*
U.S. Cl. 166—133 **23 Claims**



1. A hydraulic setting apparatus for use on the lower end of a tubing string for anchoring a well tool in a well bore responsive to pressurization of said tubing string, said tool being of the type having expandable anchor means for anchoring the tool in said well bore and a conduit for selectively permitting fluid flow through the tool, said apparatus comprising:

first and second tubular portions in telescopic engagement with each other, said first tubular portion being constructed for mounting on the tubing string and said second tubular portion being longitudinally slidable within said first portion;

means for mounting said portions on the end of the tubing string;

piston means disposed between said tubular portions for telescopically moving said portions relative to one another responsive to pressurization of the tubing string;

means for suspending such a tool mounted on the lower end of said tubular portions;

a mandrel received within said portions and being slidable between upper and lower positions; and

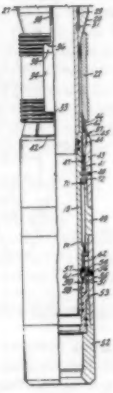
fluid pressure means mounted on said mandrel for maintaining said mandrel in its upper position.

4,441,553

ANCHOR FOR USE IN A WELL

John R. Setterberg, Jr., Richardson, and Dhirajlal C. Patel, Carrollton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 16, 1982, Ser. No. 408,454
Int. Cl.³ E21B *33/129, 33/12, 23/00, 33/128*
U.S. Cl. 166—138 **6 Claims**



1. An anchor comprising

a mandrel,

a lower slip expander on the mandrel having an upwardly facing cone,

releasable latch means latching the lower expander to the mandrel,

an upper slip expander on the mandrel having a downwardly facing cone,

a C-ring slip positioned on the mandrel between said upper and lower expander,

means movable relative to said mandrel for moving said upper expander downward for setting said slip,

a slot in the C-ring slip extending to either side of the split portion of the slip with the slip providing shoulders at the upper end of the slot,

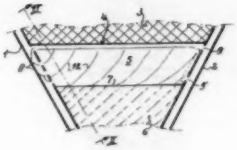
a lug carried by the upper expander and reciprocal in said slot and engageable with said slip shoulders to pull the slip off of the lower expander and support said slip, and

means carried by said mandrel for moving said upper expander from under said slip and pulling said slip off of said lower expander with said lug.

4,441,554
METHOD FOR THE UNDERGROUND GASIFICATION OF COAL OR BROWNCOAL

Arnold W. J. Grupping, Anjeliereniaan 3, Aerdenhout, Netherlands (2111 BP)

Filed Nov. 18, 1981, Ser. No. 322,476
Claims priority, application Netherlands, Nov. 28, 1980, 8006485
Int. Cl.³ C10J 5/00; E21B 43/243
U.S. Cl. 166—261 11 Claims

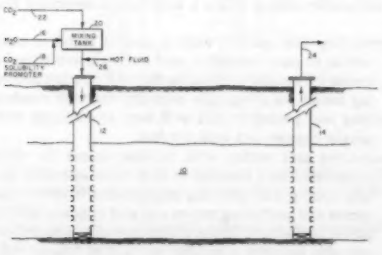


1. A method for underground gasification of coal or browncoal in an inclined coal layer, in which two boreholes are drilled from the soil surface into the coal layer, which boreholes are continued downwards in the coal layer with the slope of this layer, and which boreholes are interconnected at their lower ends, after which the coal is ignited, supplying an oxygen containing gas through one of the boreholes and discharging the combustion gases through the other one, the combustion and gasification front thus moving upwards, and taking care that the boreholes remain in communication with the cavity behind the combustion front, and, intermittently filling the cavity with a filler supplied through one of the boreholes, said method comprising suspending the filler material in a carrier substance, leading the suspension through the boreholes and the cavity with such a concentration and flow velocity that the filler material, at the reduction of the flow velocity when entering the cavity, will precipitate from the suspension; and, continuing the suspension flow until the cavity has been completely filled with the filler material with the exception of a narrow channel at the upper side of this cavity near the coal front, the width of said channel being determined by the flow velocity therein at which an equilibrium between precipitation and dragging along of the filler material is reached.

4,441,555
CARBONATED WATERFLOODING FOR VISCOUS OIL RECOVERY

Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 27, 1982, Ser. No. 372,401
Int. Cl.³ E21B 43/24
U.S. Cl. 166—272 19 Claims



1. A method for the recovery of viscous oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and at least one spaced-apart production well, said injection well and said production well in fluid communication with a substantial portion of the formation, comprising:

(a) injecting into the formation via said injection well a predetermined amount of a fluid comprising water containing a base that acts as a CO_2 solubility promoter and saturated at the injection pressure with carbon dioxide;

(b) injecting into the formation via said injection well a predetermined amount of a heated fluid; and

(c) recovering fluids including oil from the formation via said production well.

4,441,556
DIVERTER TOOL AND ITS USE

Charles A. Powers, and George B. Holman, both of Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 17, 1981, Ser. No. 293,808
Int. Cl.³ E21B 33/13
U.S. Cl. 166—290 1 Claim

1. An improved method for setting a cement plug in an open-hole section of a wellbore above the bottom thereof, said wellbore being filled above said section with liquid, including drilling mud, comprising:

lowering into said wellbore a string of pipe to the lower end of which is attached a diverter tool closing the lower end of said pipe, said diverter tool being provided with a closed lower end and a plurality of radially directed ports, whereby said ports are located essentially at the base of said section;

pumping through said pipe and through said ports into said wellbore, in order, a spacer liquid, a preselected volume of cement slurry to form a cement plug, and a follower liquid, until said slurry is in said wellbore, and

withdrawing said pipe string to permit undisturbed setting of said cement slurry to form said cement plug,

wherein the last of said spacer liquid before said cement slurry is made of a pumpable mixture of thickened drilling mud containing approximately 25–30 lbs/bbl of bentonite, whereby the plastic viscosity thereof is of the order of 60 and the yield point thereof is of the order of 120 to 130.

4,441,557

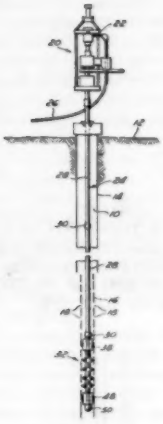
METHOD AND DEVICE FOR HYDRAULIC JET WELL CLEANING

Casper W. Zublin, Bakersfield, Calif., assignor to Downhole Services, Inc., Bakersfield, Calif.

Continuation-in-part of Ser. No. 195,303, Oct. 7, 1980, Pat. No. 4,349,073. This application Oct. 5, 1981, Ser. No. 308,582

Int. Cl.[3] B08B *3/02, 9/00;* E21B *37/00*

U.S. Cl. 166—312 18 Claims



1. A device for washing pipes comprising:

an elongate member having a plurality of jet nozzles mounted thereon, at least some of said jet nozzles being spaced along the length of said member,

said nozzles being spaced such that when said member is moved at a preselected constant speed along the length of a preselected pipe to be cleaned and rotated at a preselected constant rotational speed jet tracks of fluid streams are provided whose center to center spacing is in the range of equal to or one-half the width of said fluid streams at the inner surface of the pipe producing stream coverage of all points on the pipe to be cleaned of at least once but not more than twice.

9. A method for washing undesirable material from pipes comprising:

providing a jet carrier having a plurality of jet nozzles mounted thereon, at least some of said jet nozzles being spaced along the length of said jet carrier;

forcing a fluid through each nozzle to produce streams of fluid which strike the pipe;

moving said carrier lengthwise along said pipe at a selected speed;

rotating said carrier within said pipe at a rotational speed;

determining the velocity of movement of one of said streams of fluid across the inner surface of the pipe which will provide sufficient energy to remove the undesirable material from the pipe; and

selecting said lengthwise and rotational speeds such that they provide jet streams which cover any given point on said pipe at least once and such that the velocity of movement of each jet stream across the inner surface of the pipe is substantially equal to the velocity determined to provide sufficient energy to remove the undesirable material from the pipe.

4,441,558

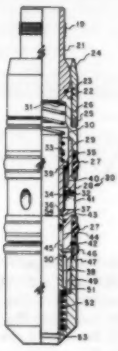
VALVE

William R. Welch, Carrollton, Tex., and Thomas J. Heard, Dubai, United Arab Emirates, assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 15, 1982, Ser. No. 368,690

Int. Cl.[3] E21B *34/08, 34/10*

U.S. Cl. 166—317 14 Claims



1. A valve for use in a well, comprising:

a. a tubular housing with a bore therethrough;

b. flow passage means in said housing communicating said housing bore with the exterior of said housing;

c. upper valve means downwardly biased to sealingly engage said housing above said flow passage means and sealingly engage movable seat means in said housing, below said passage means, providing a lower valve cooperating with said upper valve means permitting flow through said passage means into said housing bore and preventing flow from said bore through said passage means; and

d. said movable seat means being releasably positioned and upwardly biased in said housing and movable by said bias after release by predetermined pressure in said housing bore to open said flow passage means to flow.

4,441,559

RETRIEVABLE WELL PACKER

Robert W. Evans, and James W. Montgomery, both of Huntsville, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Nov. 17, 1982, Ser. No. 442,481

Int. Cl.[3] E21B *33/128, 33/129*

U.S. Cl. 166—382 9 Claims

9. A method of retrieving a well packer of the type adapted for releasable setting within a well bore, comprising the steps of:

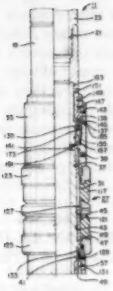
providing said packer with a central mandrel extending within an outer assembly, said outer assembly having seal means for sealingly engaging the well conduit and anchoring means for grippingly engaging the well conduit;

setting said packer in said well bore to sealingly and grippingly engage said well conduit;

providing said packer with holding means for releasably connecting said mandrel to said outer assembly to maintain sealing and gripping engagement between said seal means and anchoring means and said conduit, said holding means including a piston-collet assembly, said collet being movable between a locking position in contact with said piston whereby said mandrel is connected to said outer assembly, and a release configuration out of contac. with said piston whereby said mandrel is released for longitudinal movement relative to said outer assembly;

providing shear means for fixing said piston in said locking

configuration in contact with said collet, said shear means having a preselected shear index whereby a predetermined increase in well annulus pressure over pressure inside said central mandrel shears said shear means to release said piston;



increasing the annulus pressure to exceed said shear index to shear said shear means and release said piston;

and

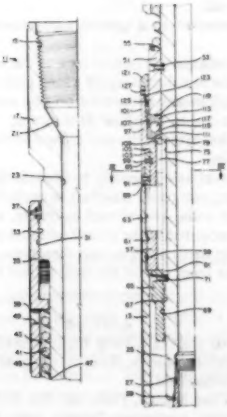
applying an upward pull to the central mandrel to release said sealing means and, in turn, said anchoring means to release said packer.

4,441,560

SETTING TOOL

John L. Baugh, and James W. Montgomery, both of Huntsville, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed May 13, 1983, Ser. No. 494,587
Int. Cl.[3] E21B *23/02*
U.S. Cl. 166—382 12 Claims



1. A setting tool of the type adapted to be made up in a pipe string for releasably engaging a setting sleeve in a well bore, comprising:

a mandrel having an upper end adapted to be connected in the pipe string and having a lower end;

a setting nut carried on said mandrel having external connecting means for engaging mating connecting means located on the interior of a setting sleeve disposed about of said mandrel;

said mandrel being slidably disposed within said setting nut when said setting nut is engaging said setting sleeve, said mandrel being slidable between an extended running-in position and a weight set-down position;

latch means operably associated with said setting nut and said mandrel for preventing relative movement between said connecting means of said setting nut and said setting sleeve when said mandrel is in said extended running-in position and allowing relative movement between said connecting means when said mandrel is in said weight set down position; and

biasing means for pre-loading said mandrel in said extended running-in position.

12. A method of releasing a setting tool of the type adapted to be made up in a pipe string in a well bore from a setting sleeve, comprising the steps of:

running the setting tool into the well bore on the end of a pipe string with a setting sleeve disposed about and engaged below said setting tool;

manipulating said setting sleeve to perform well bore operations by applying right hand torque to said pipe string from the surface;

applying sufficient right hand torque to said pipe string to override a predetermined torque responsive latch means to release said setting tool from said setting sleeve without the application of downward force to said mandrel; and

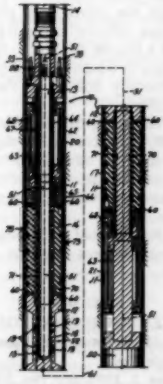
withdrawing said setting tool from said well bore.

4,441,561

METHOD AND APPARATUS FOR TREATING WELL FORMATIONS

Victor H. Garmong, R.D. No. 1, Kennerdell, County of Venango, Pa. 16374

Filed Nov. 17, 1981, Ser. No. 322,220
Int. Cl.[3] E21B *33/128, 43/00*
U.S. Cl. 166—387 36 Claims



1. A well packer comprising,

a resilient and radially expansible packer sleeve mounted on a packer body member,

means for applying a force to said packer sleeve to cause it to expand radially outwardly for engagement with a surrounding well bore wall, and

means other than the resiliency of said packer sleeve for applying a force to said packer sleeve to positively force it to contract radially inwardly out of engagement with a surrounding well bore wall,

said means for expanding and means for contracting said packer sleeve including a supply of fluid under pressure and control means located above ground and flexible conduit means connecting said supply and control means with said packer to independently apply said expanding and contracting forces to said packer sleeve through fluid

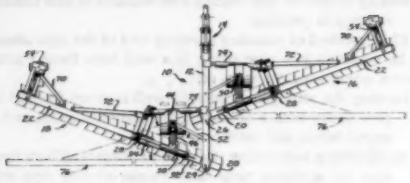
under controlled pressure from said supply and control means.

4,441,562

FOLDABLE TILLAGE IMPLEMENT

Hugh E. Cooper, 1253 Tilton Park Dr., Rochelle, Ill. 60168

Filed Sep. 4, 1981, Ser. No. 299,510
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **9 Claims**



1. A disk harrow comprising

a fore-and-aft extending generally horizontal center pole defining a longitudinal axis along the centerline thereof

a tractor hitch mounted on the forward end of said center pole symmetrically disposed with respect to said centerline and

a pair of vertical pivots spaced therebehind on the longitudinal axis of said center pole and normal thereto one behind the other;

a pair of laterally extending tool gang assembly units one on each side of said center pole and each said assembly unit comprising

a wheel-supported tool-gang-carrying inner beam connected intermediate its ends to one of said vertical pivots so as to be horizontaly moveable thereabout between a working position in which the paired tool gang assembly units assume a vee-shape relative to the travel of the harrow under the pull of a tractor hitched to the center pole, and a transport position in which the tool gang assembly units are disposed generally normal to the center pole and parallel to each other;

a wheel-supported tool-gang-carrying outer beam having its inner end hingedly connected to the adjacent outer end of the inner beam so as to be foldable vertically over the inner beam and generally parallel thereto across the center pole when said assembly units are disposed normal to the center pole; and

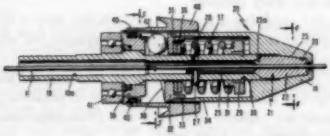
means selectively locking said tool gang assembly units in their working and transport positions.

4,441,563

TOOL COLLET AND CONTROL MEANS

Richard E. Walton, II, Fallston, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 2, 1981, Ser. No. 317,151
Int. Cl.³ A61B *17/18*
U.S. Cl. 173—163 **27 Claims**



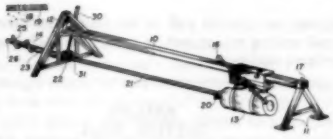
1. In a tool having a housing with a spindle drivingly connected to a motor and journaled in the housing for rotation in a forward and reverse direction, respectively, the tool further having collet means for retaining a tool element driven by the spindle, and the collet means having an open position and a closed position, respectively, the improvement which comprises, in combination, frictional means for constantly urging the collet means in its closed position, the collet means remaining closed in the forward direction of rotation of the spindle corresponding to the driving mode of operation of the tool, and cam means, responsive to the motor rotating the spindle in the reverse direction, for moving the collet means from its closed position into its open position against the force of the frictional means, the cam means including a cam track and an antifriction cam follower operatively associated with the cam track, the antifriction cam follower being out of operative engagement with the cam track in the forward direction of rotation, and operatively engaging the cam track in the reverse direction of rotation, the cam means thereby being an overrunning clutch in the forward direction and a slip clutch in the reverse direction of rotation of the spindle.

4,441,564

PORTABLE VARIABLE ANGLE DRILLING MACHINE

Michael S. Castillo, 23011 Moulton Pkwy., #C-8, Laguna Hills, Calif. 92653

Filed Jul. 27, 1981, Ser. No. 280,128
Int. Cl.³ E22C *11/00*
U.S. Cl. 175—122 **3 Claims**



1. A soft material drilling machine for use in drilling holes under a hard surface comprising in combination a geared support shaft;

two sets of triangular legs;

one set moveably attached to the end opposite the hole drilling end;

a motor mounted to a geared rack attached to a support shaft;

a means to engage the geared rack to the support shaft; and,

the invention which consists of a long hollow, flexible plastic drive shaft means connected on one end to a motor and the other end to a hollow drill means;

a water jacket around the end closest to the motor with the water inlet;

a collar swivel axle assembly to contain the drill shaft;

a dual roller, one roller attached to each side of an inverted U-shaped collar-swivel axel assembly, and a handle frictionally mounted to the swivel axle and capable of moving the plastic drive shaft in two directions; and,

holes on the front end of the drill to exit the water.

4,441,565

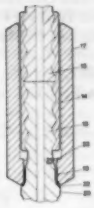
GUIDING DEVICE FOR PERCUSSION DRILLS

Bernt S. Liljekvist, Storvik, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Mar. 2, 1982, Ser. No. 353,946
Claims priority, application Sweden, Mar. 19, 1981, 8101749
Int. Cl.³ E21B *17/10*
U.S. Cl. 175—325 **9 Claims**

1. In combination a percussion drill string for rock drilling and a guide sleeve mounted coaxially upon said drill string for rotation relative thereto about a longitudinal axis of said drill string, said guide sleeve including outer surface means for engaging a wall of a bore hole to guide said drill string during drilling, said drill string including longitudinally spaced, generally radially disposed surfaces defining a longitudinal space therebetween, said guide sleeve including a radially inwardly projecting portion extending into said space such that said

surfaces and projecting portion being configured to longitudinally secure said guide sleeve to said drill string and permit



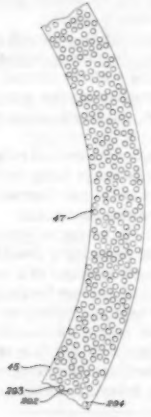
relative rotation between said guide sleeve and said drill string about said longitudinal axis when said guide sleeve is in its lowermost position on said drill string.

4,441,566

DRILL BIT WITH DISPERSED CUTTER INSERTS

Rudolf C. O. Pessier, West University Place; Rodolfo M. Ippolito, Euless, and Billy E. Baker, Houston, all of Tex., assignors to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 161,977, Jun. 23, 1980, abandoned.
This application Aug. 9, 1982, Ser. No. 406,592
Int. Cl.³ E21B *10/52*
U.S. Cl. 175—374 **8 Claims**



1. For an earth boring drill bit, an improved cutter comprising:

a cutter shell rotatably mounted on the drill bit; and

a cutting structure on the shell comprising a plurality of cutting elements, a selected region of the cutting structure having a pattern wherein all of the cutting elements are dispersed therein substantially free of all types of rows.

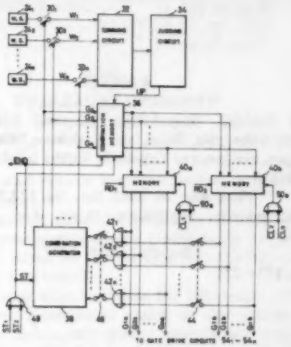
4,441,567

COMBINATION WEIGHING MACHINE

Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Company, Limited, Akashi, Japan

Filed Aug. 9, 1982, Ser. No. 406,286
Claims priority, application Japan, Mar. 15, 1982, 57-41407
Int. Cl.³ G01G *19/32*
U.S. Cl. 177—25 **7 Claims**

1. A combination weighing machine, comprising a plurality of weighing units having individual loading and unloading means for an article or articles each for weighing said article or articles each to produce signals indicative of the measured weights, respectively; a plurality of normally-open switches having a control terminal each and corresponding to said weighing units, respectively; judging means coupled to receive said weight signals of the weighing units through said switches for producing an output signal when the sum of the incoming weight signals satisfies a predetermined weight condition; a combination generator having output terminals coupled respectively to said normally-open switches for producing output signals from said output terminals sequentially in accordance with a predetermined set of mathematical combinations to close the corresponding ones of said normally-open switches; a combination memory coupled to the output terminals of said combination generator for responding to the output signal of said judging means to store the current combined



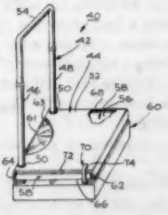
output signals of said combination generator; and control means for supplying the content of said combination memory to said loading and unloading means of the respective weighing units to control them at each end of said predetermined combination operation of said combination generator; characterized in that said control means comprises at least two auxiliary memories coupled to the output terminals of said combination memory for storing its combined output signals, a plurality of sub-control means corresponding respectively to said auxiliary memories for reading out their contents and supplying them separately to said loading and unloading means of the respective weighing units, and switch means for supplying said contents read out by said sub-control means selectively to said combination generator; and said combination generator includes means responsive to the contents of said auxiliary memories for inhibiting corresponding ones of its output signals.

4,441,568

WEIGHTING SCALE HAND SUPPORT DEVICE

Edna V. Heffner, 8808 Dempsey Ave., Sepulveda, Calif. 91343

Filed Sep. 22, 1981, Ser. No. 304,353
Int. Cl.³ G01G *19/00, 21/22*
U.S. Cl. 177—129 **10 Claims**



1. An improved weighing scale hand support device, acces-

sible to ambulatory patients from 3 sides, said device comprising, in combination:

a. an upright hand support having a generally lower vertical portion and a generally horizontal upper portion connected thereto and,

b. means for attaching said generally vertical portion of said hand support to the moveable weighing platform portion of a scale.

4,441,569

WEIGHING APPARATUS

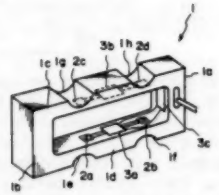
Takashi Sashiki, Nagaokakyo; Masaaki Matsuno, Kyoto; Noboru Kobayashi, Shiga, and Yoshiharu Mikami, Kyoto, all of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Japan

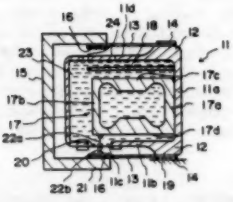
Filed Apr. 28, 1982, Ser. No. 372,706

Claims priority, application Japan, Apr. 28, 1981, 56-62474[U]

Int. Cl.³ G01G *3/14*

U.S. Cl. 177—211 **7 Claims**





1. A weighing apparatus for weighing articles through use of a weighing hopper and a load cell having strain gauges attached thereto, said weighing apparatus comprising:

a load cell having a load-receiving portion;

an amplifier substrate arranged adjacent to said load cell;

a vessel for holding a liquid of a specific gravity greater than unity, and having the load cell and the amplifier substrate attached thereto, said vessel having an opening formed in a portion therof;

a cover-portion disposed on said vessel so as to cover the opening;

a supporting member for supporting the weighing hopper for holding the articles to be weighed; and

a connecting member for operatively connecting said supporting member, said load-receiving portion of the load cell and said cover-portion.

4,441,570

CONNECTING A HUB TO THE DRIVE OF A TRACTION CHAIN VEHICLE, OR THE LIKE

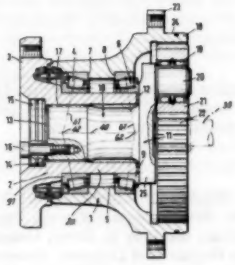
Horst Damm, Sprockhövel, and Hartwig Pfordt, Witten, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,327

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048922

Int. Cl.³ B26D *55/12*

U.S. Cl. 180—9.62 **4 Claims**



1. A mounting structure comprising:

a mounting sleeve for connection to, or being part of, a case or housing and having an annular gear being an internal ring gear for a planetary gearing;

a shaft having on one end an enlarged portion to serve as planet gear carrier, the carrier journaling a plurality of planet gears meshing with the internal ring gear;

a hub having a sleeve-like portion receiving said shaft in form-close relation, and having a mounting flange on its other end;

a pair of bearings, each with conical rollers, the axes of the rollers of the two bearings being inclined toward each other, the bearings of the pair journaling the hub, on its outside, in the mounting sleeve; and

a first one of the bearings having an inner race and an outer race, the inner race engaging a shoulder of the hub, the outer race engaging a shoulder of a radially inward oriented ridge separating the two bearings; and

a second one of the bearings having an inner race and an outer race, the outer race of the second bearings engaging said ridge on its other side, axially in relation to the outer race of the first bearings, the inner race of the second bearings extending beyond the hub.

4,441,571

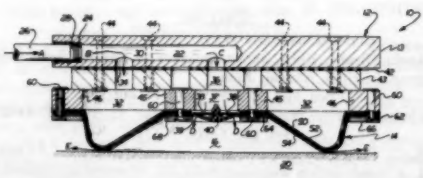
FLUID BEARING

Kenneth G. Wood, 429 SW. 116th Pl., Seattle, Wash. 98146

Continuation-in-part of Ser. No. 230,815, Feb. 2, 1981, abandoned. This application Jun. 22, 1981, Ser. No. 275,897

Int. Cl.³ B60V *1/16*

U.S. Cl. 180—128 **27 Claims**



1. A fluid bearing for supporting a load cell on a support surface, said bearing comprising a member having a first sur-

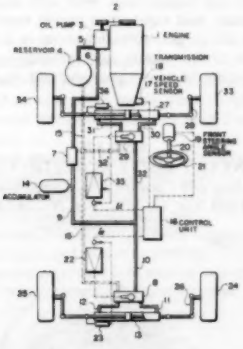
face for receiving a load thereon and a second surface, a generally annular flexible membrane, connecting means for sealingly connecting said annular membrane with the second surface of said load receiving member along radially inner and radially outer perimeter portions of said membrane, fluid inlet means for connecting said fluid bearing with a supply of operating fluid under pressure, first fluid outlet means disposed in said second surface of said load receiving member between said perimeter portions of said membrane for introducing operating fluid under pressure from said inlet means to inflate said membrane to form a plenum chamber extending between said load receiving member and the support surface, said membrane being substantially impermeable by the operating fluid and including a plurality of independently replaceable layers with at least one of said layers being formed of a flexible and dimensionally stable material for limiting expansion of said membrane upon inflation of said membrane with said pressurized fluid.

4,441,572

METHOD AND A SYSTEM FOR STEERING A WHEELED VEHICLE

Hideo Ito, Zushi, and Namio Irie, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 25, 1981, Ser. No. 305,794
Claims priority, application Japan, Nov. 18, 1980, 55-161327
Int. Cl.³ B62D 5/06
U.S. Cl. 180—140 **7 Claims**



1. A method of steering a wheeled vehicle having a pair of rear steerable road wheels, a pair of front steerable road wheels, and a steering wheel for controlling a steering force applied to the pair of front steering road wheels, comprising the steps of:

(a) sensing the vehicle speed;

(b) sensing the angle δf_D through which said steering wheel is turned;

(c) controlling the angle δf through which the pair of front steering road wheels is turned to $e\text{-}\delta f_D/(1+k)$ where e is a constant and k is a function of a detected vehicle speed; and

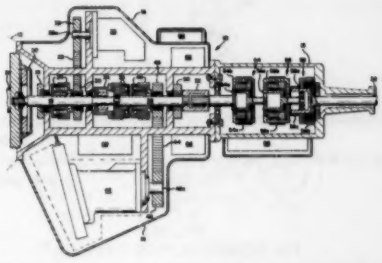
(d) controlling the angle δr through which the pair of rear steering road wheels is turned to δf/k.

4,441,573

FUEL-EFFICIENT ENERGY STORAGE AUTOMOTIVE DRIVE SYSTEM

Vincent E. Carman; David H. Anderson, both of Portland, and Eugene F. Lucas, Lake Oswego, all of Oreg., assignors to Advanced Energy Systems Inc., Menlo Park, Calif.

Filed Sep. 4, 1980, Ser. No. 184,109
Int. Cl.³ B60K 9/00; F15B 1/02
U.S. Cl. 180—165 **9 Claims**



1. In a wheeled vehicle having an engine, a vehicle drive system comprising:

(a) energy storage means for collecting and storing energy;

(b) power transmission means mechanically coupled to at least one wheel of said vehicle for driving and being driven by said vehicle;

(c) transmission control means for selectively connecting said power transmission means to said energy storage means for causing said power transmission means to deliver energy to said storage means for storage therein in response to the driving of said power transmission means by said vehicle to brake or decelerate said vehicle;

(d) transmission control means for selectively connecting said power transmission means to said energy storage means for causing said power transmission means to receive energy from said storage means to drive said vehicle;

(e) means for coupling said engine to said energy storage means for transmitting energy from said engine to said storage means for storage therein;

(f) energy sensor means connected to said energy storage means for sensing the amount of energy stored therein;

(g) control means connected responsively to said energy sensor means for stopping the transmission of energy from said engine to said storage means when the amount of energy in said storage means reaches a predetermined maximum value and for starting the transmission of energy from said engine to said storage means in response to a drop in the energy in said storage means to a predetermined minimum value;

(h) vehicle speed sensor means for sensing the speed of said vehicle; and

(i) means responsive to said vehicle speed sensor means for decreasing said predetermined maximum value in response to an increase in the speed of said vehicle from a predetermined speed.

4,441,574

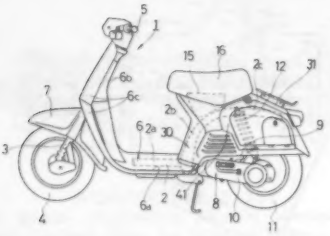
REAR COVER DEVICE FOR MOTORCYCLES

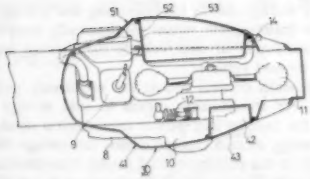
Mikihiro Kohyama, and Kozo Ohta, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,893
Claims priority, application Japan, May 21, 1981, 56-73946[U]; May 21, 1981, 56-73948[U]
Int. Cl.³ B62D 39/00
U.S. Cl. 180—219 **15 Claims**

1. In a motorcycle including: a power unit comprising an engine and a transmission case, said power unit having a front

portion thereof pivotably connected to a body frame of said motorcycle for swinging motion relative thereto, and said engine being disposed on the axis of said body frame; a rear wheel supported by a rear part of said transmission case; a single rear shock absorber which connects said transmission case to a body frame of said motorcycle; said transmission case and said rear shock absorber being disposed on a first side of said rear wheel; and an exhaust muffler disposed on a second side of said rear wheel, a rear cover device comprising:





a cover member which covers said rear wheel from above and extends substantially downwardly while covering an outside portion of said shock absorber at said a first side and an outside portion of said rear wheel at said second side; and

a container member formed integrally with and extending inwardly of said second side of said cover member, said container member being disposed above said exhaust muffler.

4,441,575

FOUR-WHEEL VEHICLE DRIVE SYSTEM

Kunihiko Suzuki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 20, 1982, Ser. No. 370,270
Claims priority, application Japan, May 11, 1981, 56-70346
Int. Cl.³ B60K *17/04*
U.S. Cl. 180—248 **23 Claims**

1. A four-wheel drive system for a vehicle having at least first and second pairs of road wheels, comprising

a power unit having an output shaft rotatable about an axis in a lateral direction of the vehicle;

a power transmission gear unit including transmission input and output shafts each having an axis of rotation parallel with an extension of the axis of rotation of the output shaft of said power unit;

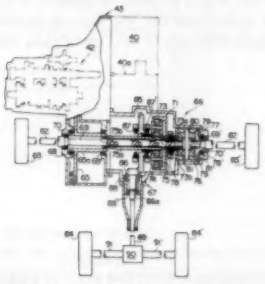
an intermediate drive gear rotatable about an axis parallel with the respective axes of rotation of the transmission input and output shafts, the transmission output shaft being held in driving engagement with said drive gear;

a first wheel drive unit comprising differential-action power splitting means operative to split driving power from said drive gear into two power components and a differential gear assembly operative to transmit one of the two power components to the first pair of road wheels;

a second wheel drive unit comprising right-angle power transfer gear means engaging said differential-action power splitting means and operative to transmit therethrough the other of said two driving power components in a fore-and-aft direction of the vehicle; and

a driveline operatively intervening between said right-angle power transfer gear means and said second pair of road wheels and adapted to be driven by the driving power component tansmitted through the right-angle power transfer gear means;

said differential-action power splitting means comprising a first planetary gear assembly which comprises an externally toothed sun gear rotatable about an axis parallel with the axis of rotation of said intermediate drive gear, an internally toothed ring gear coaxially encircling the sun gear and



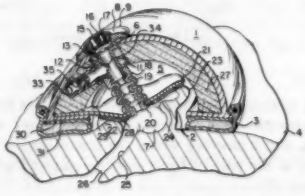
rotatable about the axis of rotation of the sun gear and a pinion carrier rotatable about the common axis of rotation of the sun and ring gears and carrying at least one planet pinion held in mesh with the sun gear and the ring gear and rotatable with respect to the pinion carrier about an axis parallel with said common axis, one of said sun gear and said ring gear being held in driving engagement with said differential gear assembly and the other of the sun and ring gears being held in driving engagement with said right-angle power transfer means, said right-angle power transfer gear means including a driven gear rotatable about an axis in a fore-and-aft direction of the vehicle, said driveline operatively intervening between the driven gear and said second pair of road wheels.

4,441,576

NONLINEAR PASSIVE ACOUSTIC FILTERING

Clayton H. Allen, 651 Concord Ave, Cambridge, Mass. 02138

Filed Apr. 19, 1982, Ser. No. 369,850
Int. Cl.³ H04R *25/02*
U.S. Cl. 181—129 **21 Claims**



1. In a sound reducing or attenuating enclosure comprising a rigid, massive, shell, the improvement comprising passive means for continuously altering the effective sound reduction or attenuation of said enclosure as a function of the instantaneous amplitude of the pressure of the sound incident upon said enclosure over at least a portion of the audio frequency range between 20 and 20,000 Hz, said passive means comprises an orifice assembly defining at least one sharp-edged orifice and

arranged in acoustically sealed relation with a hole in said shell of said enclosure, thereby preventing the entrance of any significant amount of sound into said enclosure through said hole except for such supplemental sound as may be permitted through the small open area provided by said at least one sharp-edged orifice in said orifice assembly and admits air flow into and out of said enclosure in a nonlinear, amplitude sensitive relation for allowing supplemental sound to enter said enclosure and to combine with sound entering inside said enclosure by other paths and constraining the pressure amplitude of said supplemental sound to be in a substantially direct proportion to said incident sound pressure amplitude when said incident sound pressure amplitude is below a prescribed transition value within the range corresponding to a sound pressure level of 90 to 140 dB re 2×10^{-5} N/m^2 and constraining the pressure amplitude of said supplemental sound to approach a relationship substantially proportional to the square root of said incident sound pressure amplitude as said incident sound pressure amplitude rises above said prescribed transition value.

4,441,577

DIRECTION-VARIABLE SPEAKER SYSTEM

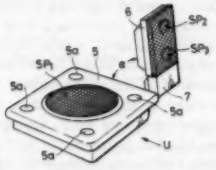
Masaki Kurihara, Tokyo, Japan, assignor to Clarion Co., Ltd, Tokyo, Japan

Filed Oct. 27, 1982, Ser. No. 437,764

Claims priority, application Japan, Oct. 30, 1981, 56-161238[U]

Int. Cl.³ H05K *5/00*

U.S. Cl. 181—147 **5 Claims**



1. Speaker system which comprsies:

first and second speaker cases for containing speaker units for different reproduction bands, respectively;

intermediate case interposed between said first and second speaker cases;

first connecting means for pivotally connecting said first speaker case and said intermediate case;

rising angle setting means for raising said intermediate case with respect to said first speaker case;

second connecting means for pivotally connecting said second speaker case and said intermediate case; and

twisting angle setting means for twisting said second speaker case with respect to said intermediate case.

4,441,578

ENCAPSULATED BULK ABSORBER ACOUSTIC TREATMENTS FOR AIRCRAFT ENGINE APPLICATION

Philip M. Rose, Chula vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation of Ser. No. 230,546, Feb. 2, 1981, abandoned. This application Jul. 19, 1982, Ser. No. 399,498

Int. Cl.³ F01N *1/24*

U.S. Cl. 181—222 **7 Claims**

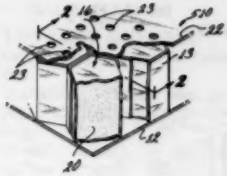
1. Acoustic absorber panels having sufficient mechanical strength for use in severe aircraft engine environments comprising:

(a) a rigid imperforate backing sheet;

(b) a central structure defined by side and end walls having a plurality of individual endwise directed cells defined by rigid divider walls;

(c) a rigid perforated facing sheet having an effective open area not greater than 50%;

(d) sound absorption material positioned within said cells; and



(e) a thin limp membrane enclosing said sound absorption material;

said rigid divider walls extend between said backing and facing sheets.

4,441,579

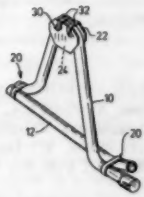
TAIL-PIPE REPLACEMENT KIT

Peter Roberts, Mississauga, Canada, assignor to Thrush Incorporated, Rexdale, Canada

Filed Apr. 23, 1982, Ser. No. 371,230

Int. Cl.³ F01N *7/18*

U.S. Cl. 181—243 **12 Claims**



1. A replacement tail pipe kit suitable for use with either a first vehicle that was originally equipped with a first tubular tailpipe having an inlet end connected to a muffler, an arched region of predetermined first configuration adjacent the inlet end, and an outlet end spaced apart from the inlet end by a first distance, or a second vehicle that was originally equipped with a second tubular tail pipe having an inlet end connected to a muffler, an arched region of predetermined second configuration adjacent the inlet end, and an outlet end spaced apart from the inlet end by a second distance, said kit comprising:

a first tubular section having an inlet end for connection to a muffler, an intermediate portion having an arch conforming to the overlapping spatial envelopes of both the first and second configurations, and an outlet end spaced apart from said inlet end by a third distance;

a second tubular section having an inlet end and an outlet end spaced apart from the inlet end by a fourth distance, the fourth distance being approximately the same as the third distance and the sum of the third and fourth distances being at least as long as the larger of the first and second distances;

means temporarily attaching the first and second tubular sections in overlapping relationship to provide a shipping package substantially shorter than either of said first and second distances; and

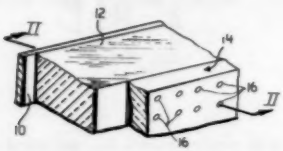
means permitting said outlet end of said first tubular section to be operatively connected to said inlet end of said second tubular section in gas flow relationship when said replacement tail pipe kit is being permanently installed in one of said first and second vehicles.

4,441,580

ACOUSTICAL CONTROL MEDIA

Michael P. Webster, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Oct. 17, 1980, Ser. No. 197,817
Int. Cl.³ E04B *1/82*
U.S. Cl. 181—286 **17 Claims**



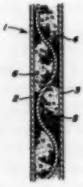
1. An acoustical panel comprising:
a septum made of an air impervious material;
a layer of low density sound absorbing material positioned adjacent to an exterior side of said septum, and constructed to absorb sound waves therein; and
a layer of medium density material positioned adjacent to an exterior side of said low density layer, and constructed to absorb sound waves therein for absorption-type sound attenuation;
said layer of medium density material having perforations extending laterally therethrough for Helmholtz-type sound attenuation.

4,441,581

COMPONENT FOR AIRBORNE-SOUND INSULATION

Rudolf Sommerhalder, Affoltern a.A., Switzerland, assignor to Hawa AG., Mettmenstetten, Switzerland

PCT No. PCT/CH79/00156, 371 Date Aug. 11, 1980, 102(e) Date Jul. 30, 1980, PCT Pub. No. WO80/01184, PCT Pub. Date Jun. 12, 1980
PCT Filed Dec. 10, 1979, Ser. No. 200,507
Claims priority, application Switzerland, Dec. 11, 1978, 12531/78
Int. Cl.³ E04B *1/82*; C04B *43/00*
U.S. Cl. 181—286 **7 Claims**



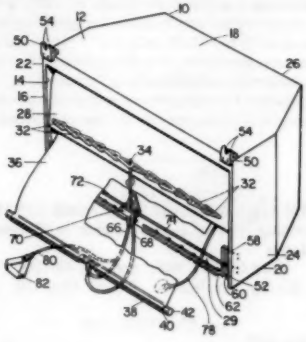
1. An airborne sound attenuating construction for use in walls, doors, and the like, comprising:
means elongated in a vertical and a horizontal dimension for providing flexible walls defining a plurality of chambers spaced apart in at least said vertical dimension;
a spherical metallic granular material consisting of a plurality of steel spheres;
said spherical metallic granular material disposed in each of said chambers in close-packing relationship; and
each of said chambers having a shape dimensiond to restrict settling movement of said spherical metallic granular material consisting of said plurality of steel spheres disposed therein in close-packing relationship, and wherein said walls defining said plurality of chambers are spaced apart approximately from 3 to 10 millimeters for forming said shape dimensioned to restrict settling movement of said spherical metallic granular material.

4,441,582

ESCAPE SLIDE SYSTEM AND METHOD OF OPERATION

James H. Ward, Jr., Plymouth, N.C., assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Dec. 16, 1981, Ser. No. 331,438
Int. Cl.³ B64D *25/14*
U.S. Cl. 182—48 **8 Claims**



1. An escape slide system comprising a slide container, an opening in said container for receiving a slide in the deflated folded condition, a frame member, a door mounted for movement into and out of a doorway in said frame member with said container being mounted on the inside surface of said door for storage in said doorway, releasable mounting means connecting said slide container and said door, said mounting means including an upper bracket mounted on said container, said upper bracket having a bifurcated plate with flanges extending upwardly for engagement with a stud extending outwardly from said door toward said container, said slide having a girt member fastened to said frame member, and slide release means responsive to movement of said door relative to said frame member to actuate said releasable mounting means and disconnect said container from said door whereby said slide is released from said container as it falls away from said door and said frame member, said slide release means including lanyard means connecting said frame member and said releasable mounting means, said lanyard means having an automatic release cable for actuating said releasable mounting means in response to movement of said door out of said doorway, said releasable mounting means including a latch connected to said automatic release cable and supporting said container on said door in an installed position, said latch being actuated by said automatic release cable upon opening of said door to release said container, said latch including a slidable latch pin connected to said automatic release cable and supporting said door in said installed position, said latch pin being pulled from said installed position by said automatic release cable upon opening of said door, and said flanges being movable out of engagement with said stud when said pin is pulled out of said installed position.

4,441,583

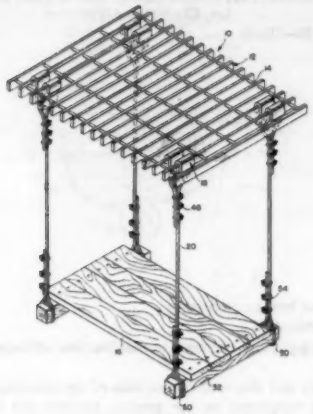
GRATING CABLE HANGER

Ronald R. Vaught, 206 E. Pine, Bloomfield, N. Mex. 87413

Filed Mar. 28, 1983, Ser. No. 479,539
Int. Cl.³ E04G *3/14*
U.S. Cl. 182—150 **10 Claims**

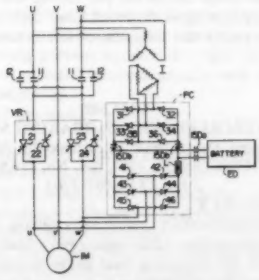
1. A grating cable hanger comprising:
parallel side walls;

a connecting bottom wall;
U-type oppositely extending bends having depending walls, said U-type bends and defending walls for hanging over a plurality of steel gratings;
a softener member positioned between said parallel side walls;



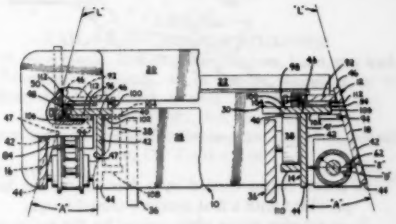
a cable having a loop at one end, said loop positioned between said parallel side walls and supported on said softener; and
a platform for workers and heavy equipment fasten to the opposite ends of said cable.

4,441,584
AC ELEVATOR CONTROL SYSTEM
Nobuo Mitsui; Yasuyuki Maeda; Tomiaki Kurihara; Seiya Shima; Takanobu Hatakeyama, all of Katsuta, and Katsu Komuro, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 31, 1981, Ser. No. 289,040
Claims priority, application Japan, Aug. 1, 1980, 55-105038
Int. Cl.³ B66B *1/28*
U.S. Cl. 187—29 R **21 Claims**



1. An AC elevator control apparatus for use in an AC elevator system including a three-phase AC power source, a three-phase induction motor, and an elevator car and a counterweight suspended from the opposite ends of a rope trained around a rotatable member driven by said induction motor, said apparatus comprising:
means for supplying AC power from said AC power source to said induction motor to control the motoring torque thereof; and
a power converting unit including means for supplying AC power having a frequency lower than that of said AC power source to said induction motor at least when said induction motor operates in a deceleration mode.

4,441,585
LIFT MAST ASSEMBLY
John E. Macnab, Dallas, Oreg., assignor to Towmotor Corporation, Mentor, Ohio
PCT No. PCT/US82/00354, 371 Date Mar. 22, 1982, 102(e) Date Mar. 22, 1982, PCT Pub. No. WO83/03406, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 22, 1982, Ser. No. 375,114
Int. Cl.³ B66B *7/02*
U.S. Cl. 187—95 **23 Claims**



1. A lift mast assembly (10) comprising:
a first movable elongate upright (24) and a first fixed elongate upright (16), said first movable upright (24) having a web (42) and a flange (96), and said first fixed upright (16) having a web (42) and a flange (92), said first movable upright (24) being mounted on the first fixed upright (16) and elevationally extensibly movable relative to the first fixed upright, said first movable upright (24) flange (96) being connected to the first movable upright (24) web (42) and projecting therefrom in a direction toward the web (42) of the first fixed upright (16), and said first fixed upright (16) flange (92) being connected to said first fixed upright (16) web (42) and projecting therefrom in a direction toward the web (42) of the first movable upright (24);
bearing means (48,50) for guiding said movable upright (24) for movement along said first fixed upright (16) and maintaining the web (42) of said first movable upright (24) a preselected minimum distance ("E") spaced apart from the web (42) of the first fixed upright (16) at a preselected location spaced from the first movable and first fixed upright flanges (96,92); said bearing means (48,50) being connected to said first fixed and first movable uprights (16,24) and engageable with said flanges (92,96);
a first lift jack (60) mounted on one of said first fixed and first movable uprights (16,24), said first lift jack (60) being nested between the webs (42) of the first fixed and first movable uprights (16,24) at said preselected location.

4,441,586
DEVICE FOR IMMOBILIZING A WHEELED VEHICLE
Jean P. Bernier, 2000 S. Eads St., Arlington, Va. 22202
Filed Oct. 19, 1981, Ser. No. 312,746
Int. Cl.³ E05B *73/00*; B60T *3/00*
U.S. Cl. 188—32 **8 Claims**

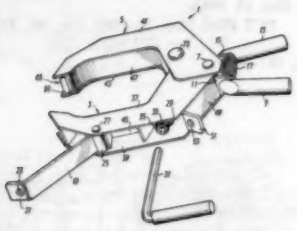
1. An improved device for immobilizing a vehicle having at least one wheel assembly, which device comprises:
(a) an active jaw;
(b) a passive jaw;
(c) each jaw being in the configuration of a C-shaped housing;
(d) means connecting the jaws for pivotal movement between open and closed positions;
(e) adjustment means disposed within and enclosed by both

jaws for variably limiting the pivotal movement of the jaws;

(f) an elongate tooth carried by each jaw for engaging opposed portions of the wheel assembly; and

(g) locking means for preventing unauthorized removal of the device from the wheel assembly including:

1. a hasp carried by the active jaw and pivotable between open and closed positions for concealing the adjustment means,



2. a first flange carried by a free end of the hasp and provided with a first aperture therethrough,

3. an exterior cover plate carried by the active jaw and including a second flange provided with a second aperture therethrough, and

4. wherein when the hasp is disposed in its closed position, the hasp and the cover plate collectively define an exterior side wall of the active jaw, with the first and second apertures being aligned for receiving a padlock bale therethrough.

4,441,587

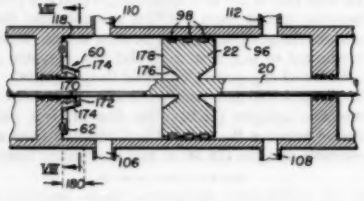
INTERNAL COMBUSTION ENGINE OR PUMPING DEVICE

Kenneth S. Patten, 1920 Latham St., #1, Mountain View, Calif. 96040

Division of Ser. No. 111,489, Jan. 14, 1980, Pat. No. 4,362,477. This application Aug. 2, 1982, Ser. No. 404,536

Int. Cl.³ F16D *55/02*

U.S. Cl. 188—70 R **4 Claims**



1. A mechanical, self-actuating brake for limiting relative longitudinal travel between first and second movable members along their axes, said first movable member being formed with a conical recess adjacent said second movable member and having a shaft extending toward said second movable member, said second movable member comprising a plurality of circumferentially arranged brake shoes in radial alignment with said shaft, a plurality of fingers being arranged radially about said brake shoes and including resilient means, said fingers being adapted for interaction with said conical recess and with said brake shoes through said resilient means for forcing said brake shoes into braking engagement with said shaft as said first member axially approaches said second member.

4,441,588

DISC BRAKE INCLUDING A SPRING FOR PRESSING A FRICTION PAD AGAINST A GUIDING PORTION

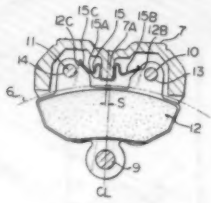
Kazuo Saito, Kanagawa, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Oct. 29, 1981, Ser. No. 316,425

Claims priority, application Japan, Nov. 1, 1980, 55/154349

Int. Cl.³ F16D *65/40*

U.S. Cl. 188—73.38 **12 Claims**



1. A disc brake comprising:

a rotatable disc,

a guiding portion extended in the direction of the axis of the disc,

a friction pad disposed on one side of the rotatable disc and being supported on the guiding portion and being displaceable relative thereto in the direction of the axis of the disc,

a pad spring provided to press the friction pad against the guiding portion in the direction of the radius of the disc and in one direction along the circumference of the disc,

wherein the pad spring has two leg portions which respectively abut with abutting surface portions of the friction pad, with one leg portion pressing the friction pad in the direction of the radius of the disc and in one circumferential direction, and the other leg portion pressing the friction pad in the direction of the radius of the disc and in the other circumferential direction, and the pressing force in said one circumferential direction is larger than that in the other circumferential direction, and

wherein said abutting surface portions are provided on two inclined surfaces which are symmetrical with respect to the circumferential center line of the friction pad, said two leg portions are symmetrical with respect to the circumferential center line of the pad spring, and the center line of the pad spring is displaced from the center line of the friction pad in the direction of the circumference of the disc.

4,441,589

CONTROLLED WHEEL BRAKING SYSTEM

Fred C. Stevens, One Garrett Pl., Bronxville, N.Y. 10708

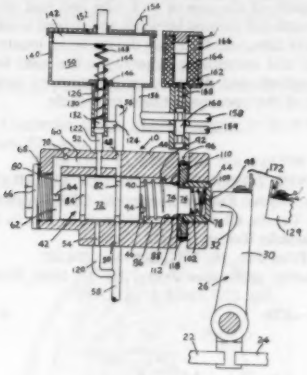
Filed Oct. 26, 1981, Ser. No. 314,879

Int. Cl.³ B60T *8/04*

U.S. Cl. 188—181 T **7 Claims**

1. A hydraulic braking system for a vehicle wheel comprising a rotatable member, brake means and a fluid brake cylinder, supply means for supplying fluid under pressure to said fluid brake cylinder for transmitting force to said brake means so as to bias said brake means against said rotatable member, valve means disposed between said fluid supply means and said fluid brake cylinder and movable between a first position and a second position for controlling the flow of fluid to and from said fluid brake cylinder, means for sensing vehicle wheel lock up and moving said valve means to said second position so as to block the flow of fluid to said fluid brake cylinder and drain fluid from said fluid brake cylinder at the instant of vehicle wheel lock up so as to unlock the vehicle wheel and means for continually sensing vehicle wheel unlock and lock up when

said valve means is in said second position and for alternately feeding and removing the drained brake fluid to and from said



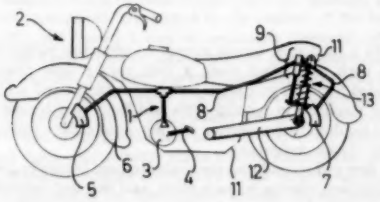
fluid brake cylinder so as to automatically pump said brake means.

4,441,590

BRAKING SYSTEM FOR MOTOR VEHICLE

Alberto Giorgetti, Paladina, Italy, assignor to Brembo S.p.A., Paladina, Italy

Filed Mar. 21, 1979, Ser. No. 22,454
Claims priority, application Italy, Aug. 4, 1978, 26517 A/78
Int. Cl.³ B60T *8/18*
U.S. Cl. 188—195 **2 Claims**



1. An adjustable braking system for motorcycles having a suspension spring and shock absorber rear suspension assembly including a spring preload adjuster, and said rear suspension assembly being mounted between a frame and a rear wheel, said system comprising:

at least one front brake;

a rear brake;

a master cylinder hydraulically connected to said at least one front brake and said rear brake; and

a brake proportioning device hydraulically connected between said master cylinder and said rear brake, said brake proportioning device including;

a pressure regulating valve for limiting the maximum pressure to be applied to said rear brake,

a calibrating spring connected to said pressure regulating valve, said maximum pressure applied to said rear brake by said pressure regulating valve increasing in proportion to the compression of said calibrating spring, and

linkage means operatively connected to said calibrating spring, said linkage means compressing said calibrating spring when the suspension spring is compressed to thereby vary the maximum pressure to be applied to said rear brake in response to variations in the length of said suspension spring, variations in the length of said suspension spring changing the length of said calibrating spring to also vary the maximum pressure to be applied to said rear brake, including,

a first bracket attached to said rear suspension assembly between said suspension spring and said spring preload adjuster,

a second bracket attached to said rear suspension assembly at the end of said suspension spring opposite to said spring preload adjuster,

said pressure regulating valve and said calibrating spring being mounted to one of said brackets, and

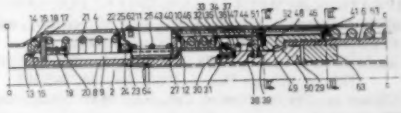
a pushrod having one end mounted to the other of said brackets, the other end of said pushrod being connected to said calibration spring to compress said calibration spring when said suspension is compressed.

4,441,591

RAIL VEHICLE SLACK ADJUSTER

Lars M. Severinsson, Hishult; Peter Beijbom, Lund, and Anders K. Martensson, Bjärred, all of Sweden, assignors to SAB Industri AB, Landskrona, Sweden

Filed Jun. 10, 1981, Ser. No. 272,180
Claims priority, application Sweden, Jun. 24, 1980, 8004668
Int. Cl.³ F16D *65/66*
U.S. Cl. 188—202 **4 Claims**



1. A rail vehicle slack adjuster of the axial type, comprisng an elongated barrel, a non-rotatable actuation rod extending out of the barrel from one of its ends, a non-rotatable threaded spindle extending out of the barrel from its opposite end, a conditionally rotatable adjuster nut in non-self-locking engagement with the spindle, and clutch means responsive to braking conditions for conditionally relatively moving the barrel and the adjuster nut, characterized in that means between the barrel and the non-rotatable actuation means for normally preventing the barrel from rotating but for making possible a manual rotation of the barrel for rotating said adjuster nut under a manual force above a threshold level comprises at least one circumferentially deformable manual adjustment clip coupling together the non-rotatable actuation means and barrel by means of a free circumferential end projection in removable resilient engagement with a notch to prevent rotation until a manual rotational force is applied to the barrel of sufficient magnitude to circumferentially deform the clip and disengage the end projection from the notch thereby permitting manual rotation of the barrel together with the adjuster nut.

4,441,592

BICYCLE BRAKE ASSEMBLY

Richard C. Everett, Lake Oswego, Oreg., assignor to Kool-Stop International Inc., Lake Oswego, Oreg.

Filed Aug. 27, 1982, Ser. No. 412,204
Int. Cl.³ F16D *69/04, 65/78*
U.S. Cl. 188—264 A **12 Claims**

1. In a bicycle brake assembly, the combination comprising:

(a) heat sink means having at least one generally planar surface;

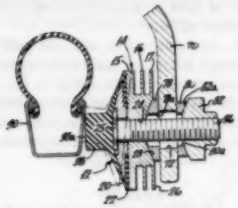
(b) a separate brake shoe means including

(i) a thermally conductive member having a support flange portion and a generally planar surface portion, said planar portion being displaced outwardly from said flange portion; and

(ii) a pad of friction material secured to and substantially surrounding said support flange portion, one surface of said pad and said generally planar surface of said ther-

mally conductive member forming a generally coplanar surface; and

(c) means for separably securing said brake shoe means to said heat sink means with said coplanar surface in thermally conductive relation with said at least one generally



planar surface of said heat sink means for enabling the transfer of heat from said brake shoe means through said thermally conductive member to said heat sink means and then to the atmosphere during braking action of the bicycle.

4,441,593

VIBRATION DAMPER ARRANGEMENT FOR VEHICLES

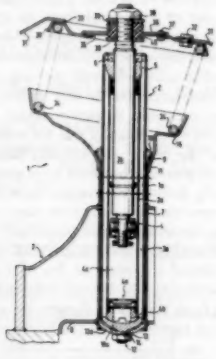
Ludwig Axthammer, Hambach, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Fed. Rep. of Germany

Continuation of Ser. No. 176,698, Aug. 11, 1980, abandoned. This application Dec. 6, 1982, Ser. No. 446,989

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2934671

Int. Cl.³ B60G *15/06*

U.S. Cl. 188—322.11 **39 Claims**



1. Vibration damper arrangement for a vehicle comprising an axially extending damper of the piston rod-cylinder type having a pair of opposite ends spaced apart in the axial direction thereof and including a cylindrical tube having the axis thereof extending in the axial direction of said vibration damper, a support for said vibration damper, said support including a hollow cylindrical receptacle having an axis, said tube being insertable into said receptacle with said axis of said tube extending in the axial direction of said receptacle, a detachable fastening device engageable at one end of said damper for securing said damper in said receptacle, wherein the improvement comprises that said fastening device applies a tension force through one end of said vibration damper with the force acting in the axial direction of and applying a tension force to said tube, a first stop surface located on said tube spaced at a distance from both ends of said tube, a second stop surface located on said receptacle remote from said fastening device and in cooperating relation with said first stop surface so that under the applied tension action of said fastening device said first stop surface presses against said second stop surface, at least one of said first and second stop surfaces extends obliquely of the axis of said tube and said receptacle has an open axial end located between and spaced axially from the ends of said tube, said fastening device being located at the other end of said receptacle, whereby when said fastening device is detached, said damper can be removed in its axial direction out of the open end of said receptacle.

4,441,594

FLUID TYPE TORQUE CONVERTER APPARATUS

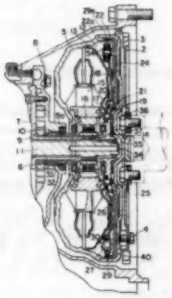
Seitoku Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tatsuo Kyushima, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 18, 1981, Ser. No. 274,807

Claims priority, application Japan, Jul. 10, 1980, 55-94693

Int. Cl.³ F16H *3/66, 45/02*

U.S. Cl. 192—3.28 **4 Claims**



1. In a fluid type torque converter apparatus including an input shaft, an output shaft, a fluid type torque converter provided between said input and output shafts, and a lockup clutch provided in parallel with said fluid type torque converter for directly connecting said input and output shafts, said lockup clutch comprising:

(a) first and second disc elements disposed in axially spaced, opposed relation to each other, said first and second disc elements having a plurality of circumferentially elongated, complementary protrusions defining cavities spaced about the circumference thereof, one of said first and second disc elements being drivingly connected to said output shaft;

(b) a third disc element being selectively connected in driving relation to said input shaft and being axially disposed between for relative rotation with respect to said first and second disc elements, said third disc element having a plurality of first elongated slots circumferentially spaced for cooperation with said cavities and a plurality of second elongated slots of a given length circumferentially spaced and located between adjacent first elongated slots;

(c) a compression coil spring disposed in each said cavity and cooperating first elongated slot, said springs acting as shock absorbers for relative rotation between said first and second disc elements and said third disc element;

(d) a plurality of elongated fasteners axially interconnecting and preventing relative rotation between said first and second disc elements, one said fastener being disposed in each said second elongated slot of said third disc element; and

(e) a plurality of heat-hardened spacers for axial spacing said first disc element relative to said second disc element, said spacers being forced independently of said fasteners, one said spacer being disposed on an intermediate portion of

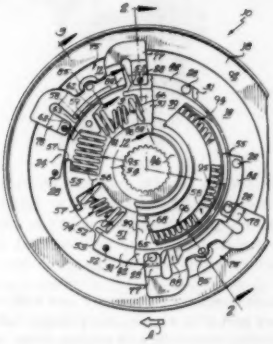
each said fastener and being received in a respective second elongated slot, each said spacer slidably engaging one longitudinal edge of its respective second elongated slot for centering said third disc element relative to said interconnected first and second disc elements.

4,441,595

HYDRAULIC PRESSURE RELIEF VALVE FOR LOCK-UP CLUTCH

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 13, 1981, Ser. No. 310,956
Int. Cl.³ F16H *45/02*
U.S. Cl. 192—3.29 **12 Claims**



1. A lock-up clutch assembly for a torque converter having a vibration damper therein, the assembly including a piston plate adapted to engage the torque converter housing, a hub assembly operatively connected to the turbine of the torque converter and having a pair of oppositely disposed radially extending arms, a pair of spring retainer plates journalled on and substantially enclosing the hub assembly, said plates being secured to the piston plate, a plurality of spring separators movably mounted within said retainer plates, and a plurality of compression springs positioned between said spring separators and hub arms, said retainer plates having diametrically oppositely disposed inwardly offset drive straps paralleling said hub arms in the path of the compression springs, the improvement comprising a pressure relief valve to equalize the fluid pressure on the opposite sides of the piston plate, said piston plate having at least one opening therein, said relief valve including a generally flat spring member secured to the piston plate, a resilient face seal carried by said spring member and normally sealing said opening, and a camming surface on the flat spring member, and a cam ring slidably mounted on said piston plate and having a camming tab generally aligned with and adjacent said camming surface, said cam ring being actuated by movement of said hub assembly in the coast direction to interengage said camming tab and said camming surface of said spring member to lift the face seal and uncover said opening.

4,441,596

VEHICLE INCHING MECHANISM INTERLOCKED WITH A BRAKING MECHANISM

Teruo Nakahara, Komatsu; Shingo Ota, Kanazawa, and Masaru Nakamura, Matsutou, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

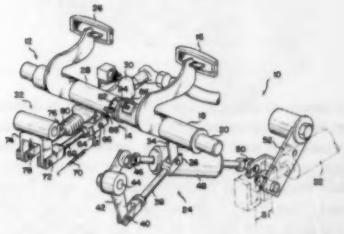
Filed Dec. 23, 1981, Ser. No. 333,794
Claims priority, application Japan, Dec. 26, 1980, 55-186693
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—13 R **4 Claims**

1. In a motor vehicle, in combination:

(a) a stationary shaft;

(b) an inching mechanism for inching the vehicle, the inching mechanism comprising:
(1) a first sleeve rotatably fitted over the stationary shaft;
(2) an inching pedal formed on the first sleeve for revolving same about the stationary shaft;
(3) an inching valve; and
(4) a first linkage connecting the first sleeve to the inching valve to allow actuation of the latter by the inching pedal;

(c) a braking mechanism for braking the vehicle, the braking mechanism comprising:
(1) a second sleeve rotatably fitted over the stationary shaft;
(2) a brake pedal formed on the second sleeve for revolving same about the stationary shaft;
(3) a brake master cylinder; and
(4) a second linkage connecting the second sleeve to the brake master cylinder to allow actuation of the latter by the brake pedal; and



(d) means for interlocking the inching mechanism and the braking mechanism so that the depression of the inching pedal results in the actuation of both the inching valve and the brake master cylinder but that the depression of the brake pedal results only in the actuation of the brake master cylinder, the interlocking means comprising:
(1) a first set of jaws provided to the first sleeve;
(2) a second set of jaws provided to the second sleeve and meshing with the first set of jaws, there being clearances between the first and the second sets of jaws to allow the revolution of either first or second sleeve relative to the other within limits; and
(3) resilient means connected between the first and the second sleeves so as to transmit only the revolution of the former, caused by the depression of the inching pedal, to the latter.

4,441,597

AUTOMATIC HUB CLUTCH

Masao Teraoka, Sano, Japan, assignor to Tochigi-Fuji Sangyo Kabushiki Kaisha, Tochigi, Japan

Filed Nov. 20, 1981, Ser. No. 323,707
Claims priority, application Japan, Apr. 28, 1981, 56-62400[U]
Int. Cl.³ F16D *1/06, 43/00*
U.S. Cl. 192—35 **2 Claims**

1. An automatic hub clutch for a four-wheel drive vehicle and comprising:

a drive shaft adapted to be rotated in a four-wheel drive mode and not to be rotated in a two-wheel drive mode;

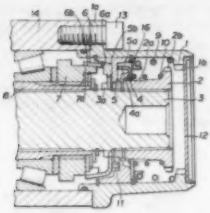
a housing rotatably mounted with respect to said drive shaft, said housing having coupling teeth;

a slide gear having coupling teeth, said slide gear being mounted to be rotated in response to rotation of said drive shaft and to be movable axially thereof between an engagement position, whereat said coupling teeth of said slide gear mesh with said coupling teeth of said housing, and a disengagement position, whereat said coupling teeth of said slide gear are spaced from and not meshed with said coupling teeth of said housing;

first spring means, positioned between said slide gear and

said housing and having a predetermined spring force, for biasing said slide gear axially of said drive shaft to said disengagement position;

second spring means, having a spring force less than said predetermined spring force of said first spring means, for biasing said slide gear axially of said drive shaft to said engagement position, said second spring means being positioned radially between said first spring means and said slide gear and coaxial thereto; and



cam means in engagement with said first and second spring means for, upon rotation of said drive shaft, causing compression of said first spring means and thereby enabling said second spring means to move said slide gear axially to said engagement position, and for, upon nonrotation of said drive shaft, enabling said first spring means to move said slide gear axially to said disengagement position.

4,441,598

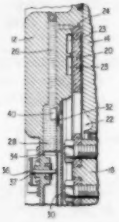
MODULATED VISCOUS FAN DRIVE

Michael Shepherd, Carmel, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 201,150, Oct. 27, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,691

Int. Cl.³ F16D *35/00, 43/25*

U.S. Cl. 192—58 B **4 Claims**



1. A viscous fluid fan drive coupling of the known temperature responsive type adapted for use with the cooling system of an internal combustion engine, the fan drive coupling including a housing, the housing including a driving chamber and a reservoir chamber, a rotary drive disc received within the drive chamber and secured to a shaft rotatably mounted within the housing, the shaft rotating with operation of the engine, a viscous shear fluid within at least one of said driving and reservoir chambers, a thermally responsive device, and thermally responsive device varying the volume of viscous shear fluid in the drive chamber, the improvement comprising, the drive chamber being provided with at least one accumulator groove, said accumulator groove being located on a wall of the drive chamber, radially inwardly of the radially outermost portion of the drive chamber and radially outwardly of the radially innermost portion of the drive chamber, whereby the coupling action from partial engagement to full coupling is modulated.

4,441,599

FLUID CLUTCH

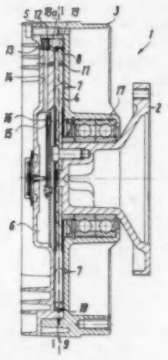
Werner Storz, Benningen, Fed. Rep. of Germany, assignor to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed Oct. 21, 1981, Ser. No. 313,506

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041793

Int. Cl.³ F16D *35/00, 43/25*

U.S. Cl. 192—58 B **14 Claims**



1. Fluid clutch comprising a primary part with a drive disc and a secondary part with a cover, the primary and secondary parts being mounted rotatably with respect to one another, the drive disc being disposed in a working chamber formed in the secondary part, said chamber communicating through a return channel with a supply chamber formed in the secondary part, for returning clutch fluid from the working chamber to the supply chamber, retarder means for increasing the clutch fluid return pressure provided in a gap between the circumference of the drive disc and a radial boundary of the working chamber, control means disposed in a control chamber of a size corresponding to the dimensions of the control means, said chamber being displaced axially relative to the drive disc, and being located in the secondary part, two bores are provided at an angle extending radially and circumferentially relative to said drive disc and said control chamber, said bores terminating in the vicinity of the circumferential ends of the retarder means, in said gap between the drive disc and the radial boundary of the working chamber, and in said control chamber, said return channel extending from the supply chamber to the control chamber.

4,441,600

DIAPHRAGM CLUTCH COVER ASSEMBLIES

André Caray, Paris, France, assignor to Valeo, Paris, France

Filed Jun. 30, 1981, Ser. No. 279,186

Claims priority, application France, Jul. 2, 1980, 80 14712

Int. Cl.³ F16D *13/44*

U.S. Cl. 192—89 B **18 Claims**

1. A diaphragm clutch cover assembly for a motor vehicle of the kind comprising a cover, a diaphragm spring having a Belleville washer outer peripheral portion and a central portion divided into radial fingers, assembly means rockably mounting said diaphragm spring on said cover, a pressure plate fixed for rotation with said cover and admitting of limited axial displacement relative thereof, said Belleville washer outer peripheral portion bearing against said pressure plate, said assembly means including a fulcrum ring disposed on one side of said diaphragm spring remote from said cover and a plurality of retaining tabs extending through openings formed in said diaphragm spring proximate to radially outer ends of said fingers for attaching said fulcrum ring relative to said cover,

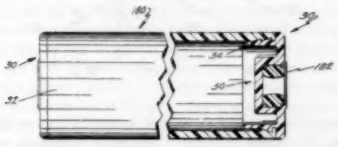
the improvement wherein said retaining tabs are fixed axially relative to and associated with a selected one of said cover and said fulcrum ring, a plurality of means defining apertures fixed axially relative to the nonselected one of said cover and fulcrum ring for receiving said retaining tabs, tongues formed in a selected one of said means defining apertures and said retaining tabs resiliently engaging contact surfaces formed on the nonselected one of said means defining apertures and said retaining tabs and transversely clamping the latter for maintaining said fulcrum ring in a predetermined axial position relative to said cover against axial forces exerted thereon by said diaphragm spring in the course of rocking movement.

4,441,601

PLASTIC CONVEYOR ROLLER AND METHOD OF MAKING SAME

William R. Rood, Muskegon, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Apr. 20, 1981, Ser. No. 255,510
Int. Cl.³ B65G *39/09*
U.S. Cl. 193—37 **48 Claims**



1. An end cap adapted for ultrasonic insertion into an end of a thermoplastic conveyor roller tube having an outside diameter so that the end cap and roller tube are mechanically interconnected, said end cap comprising:

a molded crystalline thermoplastic body, said body defining:

an axially extending hub, said hub being tapered along at least a portion thereof from an inner end to an outer end along an outer peripheral surface;

an outer flange extending radially outwardly from the outer peripheral surface of said hub; and

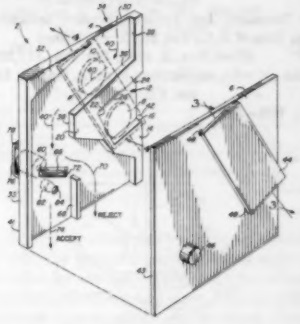
a plurality of tapered, axially spaced barbs, each barb extending around substantially the entire outer peripheral surface of said hub, said barbs being axially positioned between said inner end of said hub and said outer flange, said body further defining a circumferential groove opening through said outer peripheral surface between said inner end and adjacent said outer flange and wherein said outer flange has an outer diameter greater than the maximum diameter of said barbs.

4,441,602

ELECTRONIC COIN VERIFICATION MECHANISM

Joseph Ostroski, 3413 W. Aster, Phoenix, Ariz. 85029, and Lawrence M. Briski, 2510 W. Palo Verde Dr., Phoenix, Ariz. 85017

Filed Dec. 2, 1981, Ser. No. 326,573
Int. Cl.³ G07D *5/08*
U.S. Cl. 194—100 A **2 Claims**



1. An apparatus for verifying the authenticity of a coin under test, said apparatus comprising in combination:

a. retaining means for releasably retaining a reference coin;

b. guide means for guiding a coin under test along a predetermined path;

c. first and second matched drive coil, said first drive coil being disposed adjacent to one side of said retaining means, and said second drive coil being disposed adjacent to one side of said predetermined path;

d. an oscillator coupled to said first and second drive coils for applying a first generally sinusoidal voltage to said first drive coil and a second generally sinusoidal voltage to said second drive coil, said first and second generally sinusoidal voltages being substantially equal in magnitude.

e. first and second matched sense coils inductively coupled to said first and second drive coils, respectively, said first sense coil being disposed adjacent to said retaining means on a side thereof opposite said first drive coil, and said second sense coil being disposed adjacent to said predetermined path on a side thereof opposite said second drive coil; and

f. a comparator coupled to said first and second sense coils for comparing the voltages inductively coupled to said first and second sense coils and generating an output signal when the voltages inductively coupled to said first and second sense coils are substantially equal for indicating the authenticity of the coin under test, said comparator including a differential amplifier having first and second inputs coupled to said first and second sense coils, respectively, said differential amplifier having an output terminal for providing a first signal when the voltages inductively coupled to said first and second sense coils are not substantially equal and providing a second signal when the voltages inductively coupled to said first and second sense coils are substantially equal, said comparator also including a first retriggerable monostable multivibrator having a trigger input coupled to the output terminal of said differential amplifier, said first retriggerable monostable multivibrator being continuously triggered by said first signal provided by said differential amplifier and said first retriggerable monostable multivibrator not being triggered by said second signal provided by said differential amplifier, said first retriggerable monostable multivibrator including an output terminal for generating said output signal of said comparator as a first output level when said first retriggerable monostable multivibrator has been triggered and as a second output level when said first retriggerable monosta-

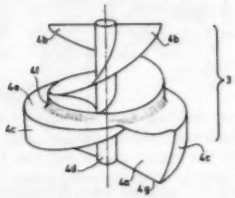
ble multivibrator has not been triggered, said second output level indicating that the coin under test is authentic.

4,441,603

SINGLE OR MULTIPLE HEAD FOR EXTRACTION OF BULK MATERIALS

Ulysse Baumard, Les Essarts, France, assignor to Etablissements Briand S.A., Les Herbiers, France

Filed Nov. 3, 1981, Ser. No. 317,907
Claims priority, application France, Nov. 4, 1980, 80 23672
Int. Cl.³ B65G *65/16*
U.S. Cl. 198—518 **10 Claims**



1. Apparatus for simultaneous extraction of a pasty, particulate or pulverulent bulk material, with or without moisture, and transfer to an intake manifold where it is taken over for discharge to a loading or dumping station, said apparatus comprising a sheet material housing (**1**) defining said intake manifold for the bulk material, said housing comprising at least one cylindrical sleeve (**1***a* or **1***b*) having a vertical axis, an extraction device (**3**) having an upper part (**4***b*) and a lower part (**4***a*), said upper part (**4***b*) comprising a worm rotatably mounted in said sleeve and having a diameter corresponding to that of said sleeve, said lower part (**4***a*) comprising at least one spiral helical flight coiled around a central hub (**4***d*) and extending from the lower end of said sleeve, a vertical wall (**4***c*) laterally bounding said spiral helical flight, a conduit of closed section being defined between said central hub (**4***d*) and said vertical wall (**4***c*) for conveying the bulk material to said upper part of said extraction device, a ledge (**4***e*) connecting said upper and lower parts of said extraction device, the outer edge of said ledge being joined to said vertical wall, and said spiral helical flight being integral with and joined smoothly to said worm.

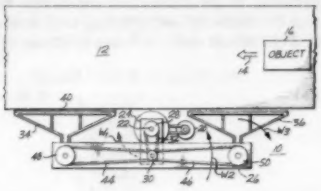
4,441,604

PUSHER MECHANISM

Harold W. Schlig, Grapevine, and Joel L. Staehs, DeSoto, both of Tex., assignors to BAE Automated Systems, Inc., Carrollton, Tex.

PCT No. PCT/US82/00854, 371 Date Jun. 24, 1982, 102(e) Date Jun. 24, 1982, PCT Pub. No. WO84/00144, PCT Pub. Date Jan. 19, 1984
PCT Filed Jun. 24, 1982, Ser. No. 405,960
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—598 **4 Claims**

1. A pusher mechanism comprising:
a link rotatably driven at one end thereof;
an arm pivotally mounted to the free end of the link at a central location of said arm;
a pair of paddles, each paddle being pivotally mounted to an end of said arm; and
drive means for rotatably driving said link, arm and paddles in predetermined directions and at predetermined speeds such that each paddle is controllably driven from rest position into engagement with an object for the controlled



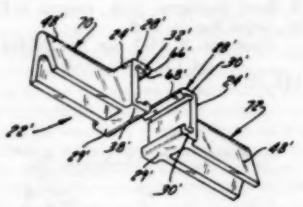
deflection thereof, thereafter the paddle returning to a rest position.

4,441,605

TWO-PIECE SNAP-ON FLIGHT FOR A CONVEYOR CHAIN

Kenneth J. Ronco, Brookfield, and Robert E. Stacey, Waukesha, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Aug. 28, 1981, Ser. No. 297,378
Int. Cl.³ B65G *19/24*
U.S. Cl. 198—731 **3 Claims**

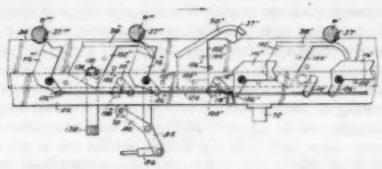


1. A chain link pusher conveyor assembly, comprising:
a chain composed of chain links each including a pair of sidebars, each sidebar having inner and outer surfaces and upper and lower edges; and
a snap-on flight mounted on said link, comprising at least one piece, each piece comprising a resilient side portion lying against the outer surface of one of said sidebars, an arm projecting laterally outwardly from said side portion, and two lips, at least one of which is resilient, one at each end of said side portion, each of said lips comprising a vertical portion which engages the inner surface of the adjacent sidebar and a horizontal portion which engages one of the edges of the sidebar for releasably holding said portion against said outer surface of said sidebar, each piece having a groove along its inner surface at the intersections of side portion with said horizontal portions;
wherein said piece may be readily detached from said sidebar by exerting a bending force on said piece to release said lips from engagement with said inner surface, and said piece may be securely attached, and remain attached to said sidebar during normal operation, by elastically deforming and snapping said resilient lip into engagement with said inner surface where they are held by the resilience of said resilient lips and said side portion.

4,441,606
ACCUMULATING TRANSFER UNIT

Jack E. Miller, St. Clair Shores, and Robert C. Brandenburg, Mt. Clemens, both of Mich., assignors to Harry Major Machine and Tool Co., Fraser, Mich.

Continuation of Ser. No. 173,989, Jul. 31, 1980, abandoned. This application Oct. 29, 1982, Ser. No. 437,732
Int. Cl.³ B65G 25/00
U.S. Cl. 198—751 3 Claims



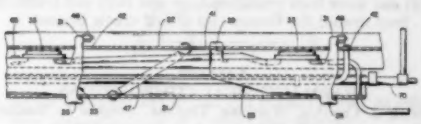
1. In an accumulating transfer unit including an elongate fixed frame having an upstream end and a downstream end, means defining a plurality of workpiece support stations uniformly longitudinally spaced from each other along said fixed frame, an elongate transfer frame, drive means for driving said transfer frame in repeated cycles of movement relative to said fixed frame, each cycle of movement commencing at a rest position from which said transfer frame is first elevated, then moved longitudinally downstream relative to said fixed frame, then lowered and then returned to said rest position, a plurality of workpiece carrier members mounted at uniformly spaced positions longitudinally along said transfer frame for movement relative to said transfer frame between an operative position and an inoperative position, each carrier member being operable when in its operative position to lift a workpiece from one station and carry said workpiece downstream to the next station during a cycle of movement of said transfer frame and each carrier member being inoperable to lift or carry workpieces when in its inoperative position, a sensing means mounted on said fixed frame adjacent each station to be located in a first position in response to the presence of a workpiece at the associated station and gravitationally biased to a second position in the absence of a workpiece at the associated station, a plurality of actuating members mounted at uniformly spaced positions along said transfer frame between said carrier members, each actuating member being associated with one of said sensing means and movable thereby when the associated sensing means is in its second position from an inoperative position to an operative position, and connector means coupling said carrier members to each other for transmitting movement of one carrier member from its inoperative to its operative position to all carrier members upstream from said one carrier member to cause said carrier members upstream from said one carrier member to move from their inoperative to their operative positions simultaneously with said one carrier member;

the improvement wherein each of said carrier members and each of said actuating members comprise a pivotal support mounting the member for pivotal movement on said transfer frame and an arm portion extending radially from said pivotal support, said arm portions being of uniform radial length, said connecting means comprising a flexible cord or chain connected to each of said arm portions to extend between adjacent arm portions in a taut condition when said adjacent arm portions are in parallel relationship with each other, each of said sensing means having an abutment thereon engageable when the sensing means is in its second position with its associated actuating means when said transfer frame is elevated to pivot the arm portion of the engaged actuating member from its inoperative to its operative position by swinging the arm portion in a direction tensioning the cord or chain coupled thereto in a downstream direction to thereby cause a corresponding pivoting movement of all members upstream thereof, and reset means operable during return movement of said transfer frame for restoring all members located in their operative position to their inoperative position.

4,441,607
MODE CHANGING MEANS FOR ACCUMULATOR CONVEYORS

Clyde L. Bowman; Charles R. DeVries, both of Grand Rapids, and Charles W. Saur, Sparta, all of Mich., assignors to Lear Siegler, Inc., Grand Rapids, Mich.

Filed Sep. 4, 1981, Ser. No. 299,320
Int. Cl.³ B65G 13/06
U.S. Cl. 198—781 11 Claims

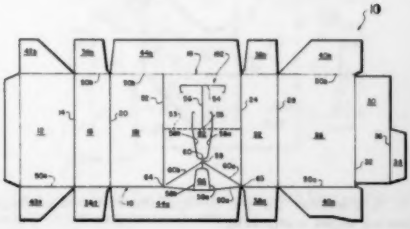


1. An operator for an accumulator conveyor characterized by a pair of vertically spaced elongated plates superimposed one above the other; means holding the lower one of said plates stationary; an actuator between said plates; said actuator at one end having a footpiece passing through the lower of said plates and pivotally securing said actuator to said lower plate and a hook at the opposite end passing through the upper of said plates and pivotally securing said actuator to said upper plate; expander means mounted on said actuator intermediate its upper and lower ends for forcing said upper plate to separate from said one end of said actuator and causing said upper plate and said actuator to pivot about said footpiece and said hook for moving said plates apart when actuated; means at said one end of said actuator engaging said upper plate for limiting the distance to which said plates can be separated; means on said upper plate for supporting a propelling member.

4,441,608
DISPLAY CARTON

Thomas D. Pawlowski, Neenah, Wis., assignor to James River-Dixie/Northern, Inc., Norwalk, Conn.

Filed May 1, 1981, Ser. No. 259,679
Int. Cl.³ B65D 5/50, 85/14
U.S. Cl. 206—45.14 14 Claims



1. A carton having cradle means for holding an elongated container, said cradle means having top and bottom ends, top and bottom portions respectively adjacent said top and bottom ends and a length dimension between said ends with which the length dimension of the elongated container is to be aligned, and two sides and a width dimension therebetween, said width dimension being defined perpendicular to said length dimension, said cradle means comprising:

(a) a unitary panel of carton material, said panel having a first cut line therein, said cut line being spaced from said top end and extending generally along the width dimen-

sion of said cradle means, and being sufficiently long as to receive a fin of the container to be packaged in the carton;

(b) a second cut line extending from said first cut line in a direction along the length of said cradle means and terminating at a point a distance from said bottom end;

(c) third and fourth cut lines on opposite sides of said second cut line, spaced between said second cut line, and said sides, each of said third and fourth cut lines extending from the top portion of said cradle into the bottom portion of said cradle, said second, third and fourth cut lines forming a supporting panel, said third and fourth cut lines being connected to form said supporting panel into a tongue-like panel which will accommodate and support containers of various dimensions;

(d) and score lines extending from said third and fourth cut lines toward the bottom end of said cradle means.

4,441,609

PHARMACEUTICAL COMPOSITIONS

Patrick J. Crowley, Worthing, England, assignor to Beecham Group Limited, England

Division of Ser. No. 949,028, Oct. 6, 1978, abandoned. This application Mar. 5, 1979, Ser. No. 17,365

Claims priority, application United Kingdom, Oct. 11, 1977, 42191/77

Int. Cl.³ A45F *3/00*

U.S. Cl. 206—204 **8 Claims**

1. A packaged pharmaceutical composition of enhanced storage stability which comprises a closed container containing one or more unit-dose compositions suitable for oral administration each dosage unit of which comprises 20 mg to 1500 mg of amoxycillin trihydrate, 20 mg to 500 mg of potassium clavulanate and a pharmaceutically acceptable carrier with the proviso that the weight ratio of amoxycillin trihydrate to potassium clavulanate is from 6:1 to 1:1 and a desiccant.

4,441,610

CONTAINER FOR THE STORAGE AND WITHDRAWAL OF EAR CLEANING STICKS OR SIMILAR ARTICLES

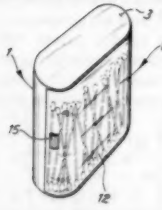
Mario Cavalcante, Thiene, Italy, assignor to Ivalda S.p.A., Italy

Filed May 18, 1981, Ser. No. 264,327

Claims priority, application Italy, May 16, 1980, 64254/80[U]

Int. Cl.³ B65D *8/00*

U.S. Cl. 206—361 **5 Claims**



1. A container for the storage and removal of hygienic cleaning sticks, comprising:

a first body and a second body pivotably connected to said first body so that it is movable relative thereto between an open and closed position, in the latter position of which said bodies cooperate to define a single flattened tubular body, with two flat front and rear walls connected by two generally semicylindrical side walls and two generally flat top and bottom walls, which top and bottom walls are integral with said first body and are disposed at a right angle to said front and rear walls, said first body comprising said rear wall which is further provided with a finger hole formed therethrough and two curved lateral end walls joined to opposite lateral edges of said rear wall and said top and bottom walls integrally joined to said rear walls and said lateral end walls, and said second body comprising said front wall, two additional curved lateral end walls joined to opposite lateral edges of said front wall, a base wall joined to the lower edge of said front wall and said additional curved lateral end walls and disposed in a generally normal manner relative thereto, and an inner wall spaced rearwardly of said front wall and joined to said base wall and said additional curved lateral end walls, which is about one half the height of said front and rear walls and is dimensioned and configured to complement the inner profile of said first body such that it lies flush against at least a portion of the inner surface of said rear wall of said first body when said bodies are in said closed position thereof, said inner, base, front and additional curved lateral end walls of said second body cooperating to form a storage compartment for said hygienic cleaning sticks wherein the top of said compartment is open when said first and second bodies are in the open position, said second body being secured by a hinge to said first body for pivotable movement along a free edge of one of said additional curved lateral end walls thereof, said hinge comprising a pair of cooperating nibs and holes, said nibs being mounted on one of said bodies and said holes being formed in the other of said bodies, said pivotable movement permitting said first and second bodies to be moved to a closed position by telescoping said second body into said first body wherein said base wall of said second body is nested upon the bottom wall of said first body and said top wall of said first body closes the top of said storage compartment, said inner wall having a section slanting up for about one fourth of the container height towards a lateral side edge of said front wall distal to said hinge, said inner wall and said slanting section cooperating to contain said hygienic cleaning sticks within said compartment when said first and second bodies are in the open position, said bodies being releasably maintained in said closed position by two cooperating lugs one of which is provided on a free edge of the curved lateral end wall of said first body distal from said hinge and the other of which is provided on a free edge of the curved lateral end wall of said second body distal from said hinge, said second body having generally in the middle of the external surface of said curved lateral end wall thereof distal from said hinge, a small narrow finger-engageable ridge to facilitate opening of the container.

4,441,611

MULTIPACK AND METHOD OF MAKING IT

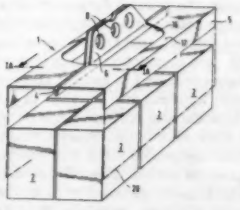
Gabriella Sommariva, Milan, Italy, assignor to MPS - Multi Packaging Services S.r.l., Milan, Italy

Filed Mar. 10, 1982, Ser. No. 356,851

Claims priority, application Italy, Mar. 12, 1981, 20311 A/81

Int. Cl.³ B65D *73/00, 5/46, 25/28*

U.S. Cl. 206—431 **9 Claims**



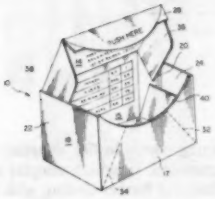
1. A method of joining articles in boxes or containers of a generally parallelepiped shape to form a multipack package comprising the steps of: die cutting a blank to provide cut lines in the blank defining two spaced areas each comprising three

sides of a trapezoid; forming two rows of juxtaposed containers, placed inside guides; folding in the form of a V a band of a blank end positioning said V so that said trapezoidal areas extend outwardly in opposite directions from the end of said band; applying an adhesive on the inner surface of the folded V band and pressing the V band to obtain its closure; applying an adhesive at least on spots on the blank surfaces which are at right angles and adjacent to those being in contact with the longitudinal V band; introducing the so formed central longitudinal V portion of the blank between the two rows of containers; clamping the parts until the adhesive has set and joined the containers to the multipack; and separating said areas along said cut lines from the remainder of said blank and lifting the same to provide handles.

4,441,612
EASY OPEN CARTON

Richard T. Kingsley, Penfield, and Larry Sherman, Macedon, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 29, 1981, Ser. No. 230,094
Int. Cl.³ B65D *5/54*
U.S. Cl. 206—620 **5 Claims**



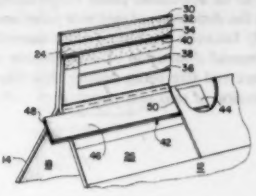
1. A carton comprising:
first and second hingedly connected rectangular side walls;
third side wall structure hingedly connected to both said first and second side walls;
first and second opposed end walls hingedly connected to said second side wall and said third side wall structure, but not to said first side wall, whereby said walls and said wall structure form an enclosure;
first tear line structure extending across said second side wall to the corners of said first side wall adjacent to said second side wall, whereby said first side wall and a first portion of said second side wall can be disengaged from a second portion of said second side wall, said second portion including first, second, and third regions connected to said first end wall, second end wall, and third side wall structure, respectively, so that said first side wall can be moved to open the carton when said tear line structure is severed; and
second tear line structure extending from said first tear line structure to the corners of said third side wall structure adjacent to said second side wall, whereby said first and second regions of said second portion can be disengaged from the said third region of said second portion so that said carton can be opened flat when both said first and second tear line structures are severed.

4,441,613
CONTAINER WITH RESEALABLE CLOSURE

Paul O. Hain, Hamilton, and J. George Lepisto, Middletown, both of Ohio, assignors to Champion International Corporation, Stamford, Conn.

Filed Sep. 1, 1982, Ser. No. 413,725
Int. Cl.³ B65D *33/22*
U.S. Cl. 206—621 **18 Claims**

1. A resealable container which comprises:
a body portion having an opening at one end thereof providing access to the container interior;
a fold-over flap hingedly coupled to said body portion along a fold line for extending over and closing said opening, said flap being attachable to said body portion by seal means extending adjacent to and generally along said opening;
means for lifting and resealing said flap including a strip of pressure adhesive tape having a first end portion adhered

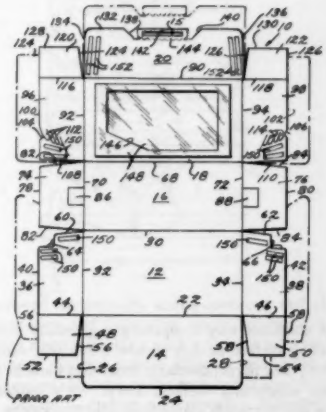


to the container and second end portion having an adhesive surface covered by a removable abherent;
whereby said tape engages and separates said flap from said body portion when lifted, and said tape reseals said flap after opening by adhering to said flap and body portion upon removal of said abherent.

4,441,614
FRONT LOADED AND CLOSED CARTON WITH HINGED TOP COVER

Richard F. Gulliver, Tuscaloosa, Ala., assignor to Gulf States Paper Corporation, Tuscaloosa, Ala.

Filed Jan. 19, 1983, Ser. No. 459,146
Int. Cl.³ B65D *5/54*
U.S. Cl. 206—624 **27 Claims**



1. A cut and scored flat blank of paperboard for erection into a product containing carton comprising
a rectangular bottom panel,
a rectangular front panel hinged along one side to one side of said bottom panel in coextensive relation therewith, the opposite side and ends of said rectangular front panel being defined by cut free edges,
a rectangular rear panel hinged along one side to the opposite side of said bottom panel, said rectangular rear panel being of a size substantially equal to the size of said front panel,
a rectangular cover panel hinged along one side to the opposite side of said rear panel, said rectangular cover panel being of a size substantially equal to the size of said bottom panel, and

a rectangular closure panel hinged along one side to the opposite side of said cover panel in coextensive relation therewith,

said bottom, rear and cover panels having end flaps hinged to the ends thereof,

the dimension of each of said end flaps measured perpendicular to its associated panel hinge being substantially less than the dimension of said rear panel measured perpendicularly between the hinged sides thereof,

the aforesaid dimension of each bottom end flap and each closure end flap being greater than one-half the aforesaid dimension of said rear panel.

4,441,615

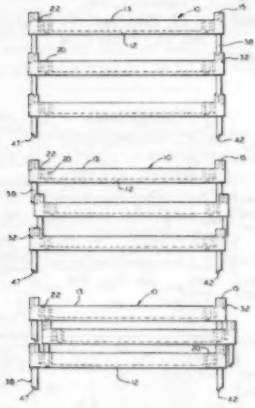
STACKABLE TRAY

D. Stephen Goodrich, 4322 Fig Tree Woods, San Antonio, Tex. 78249

Filed Sep. 29, 1982, Ser. No. 428,194

Int. Cl.³ B65D *21/02*

U.S. Cl. 206—511 **10 Claims**



1. A stackable tray comprising a generally planar product supporting surface having parallel sides, side walls extending upwardly and perpendicularly from said parallel sides of said product supporting surface, lower walls extending downwardly and perpendicularly from said supporting surface and generally below said side walls, the lower portion of said lower walls having a width less than the width of the remainder of said lower walls, first and second planar tray support surfaces extending horizontally and perpendicularly from both sides of said side walls, said first planar tray support surfaces extending outwardly from said side walls and said second planar tray support surfaces extending inwardly therefrom, said second planar tray support surfaces defining a plane above and parallel to said product support surface and each of said second planar tray support surface having a pair of slots therein, said slots being parallel to one another and to said side walls, a first one of said slots having a width exceeding the width of said lower walls and the second of said slots having a width less than the width of said lower walls, but greater than the width of said lower portion thereof.

4,441,616

PROCESS FOR SORTING COARSE TO FINE MATERIALS ACCORDING TO THEIR CHEMICAL COMPOSITION

Rainer Konig, Eshborn; Hans-Ulrich Freund, Friedrichsdorf; Helga Heide, Kelkheim, and Rolf A. Sieglen, Sulzbach, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

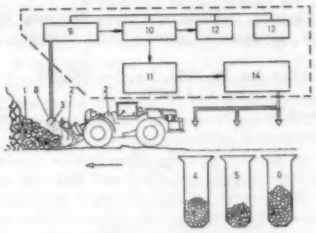
PCT No. PCT/EP80/00010, 371 Date Oct. 27, 1980, 102(e) Date Oct. 27, 1980, PCT Pub. No. WO80/01837, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 22, 1980, Ser. No. 212,728

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907513

Int. Cl.³ B07C *5/00*; E21C *41/06*

U.S. Cl. 209—44.1 **24 Claims**



2. Process for sorting coarse to fine materials according to their chemical composition, in which samples are taken and analyzed, and in which the further dealing with said materials is controlled according to the results of the analysis, characterized in that the samples are taken in the form of an air swirled dust mixture of coarse dust and fine dust, the air swirled dust mixture being generated during movement of said material, that the coarser dust is separated from the fine dust, the fine dust having a grain size of less than 200 μm, and that at least a fraction of the fine dust is analyzed.

4,441,617

STORAGE STRUCTURE COMPRISING MOVABLE RACKS

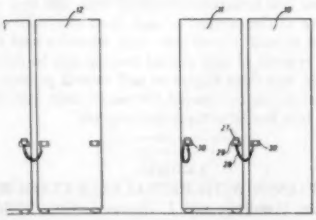
Klas Y. Forsberg, Karlstad, Sweden, assignor to Electrolux Constructor Aktiebolag, Saffle, Sweden

Filed Jun. 16, 1981, Ser. No. 274,301

Claims priority, application Sweden, Jun. 27, 1980, 8004768

Int. Cl.³ A47B *53/00*

U.S. Cl. 211—1.5 **11 Claims**



1. In a storage structure comprising several aligned storage racks, the majority of which are movable between two end positions in order to form a passageway between two adjacent storage racks, an elongate locking means arranged between each pair of adjacent storage racks, and an activating member for starting the process of movement arranged on each storage rack, the improvement wherein one end of the elongate lock-

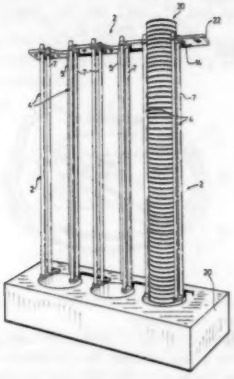
ing means is secured to one of a pair of storage racks and the other end thereof is connected to the activating member, said activating member comprising a movable contact member selectively connectable to a stationary contact member on said one of a pair of storage racks for starting process of movement and to the adjacent storage rach for mechanical locking of the passageway formed between the storage racks.

4,441,618

CONTAINER CHUTE FOR FAST RECEPTION OF NESTED CONTAINERS

Derek V. Mancini, Markham, Canada, assignor to Consumers Glass Company Limited, Etobicoke, Canada

Filed Oct. 13, 1981, Ser. No. 310,981
Int. Cl.³ A47F *1/00*
U.S. Cl. 211—49 D **10 Claims**



1. A container chute for maintaining nested containers in a generally vertical manner to allow such containers to be dispensed with the assistance of gravity, said chute comprising support means extending generally vertically positioned to positively maintain such containers in a generally vertical manner, said chute having an open bottom allowing said containers to be dispensed through said open bottom, a portion of said support means being movable outwardly of the chute to an open position to allow lateral insertion of a stack of containers into said support means whereupon said movable portion is returned to a closed position to positively maintain such inserted stack.

4,441,619

TOOL HOLDER COMBINATION

Ernest L. Gibitz, 86 Elinor Ave., Akron, Ohio 44305

Filed Jun. 1, 1982, Ser. No. 383,810
Int. Cl.³ A47F *5/08*
U.S. Cl. 211—60 T **2 Claims**

1. A tool holder combination for use with a perforated support panel, comprising:

(A) an elongate plate having tool engagement means and having front and rear surfaces and two integral panel engaging hooks projecting from the rear surface adjacent opposed ends thereof;

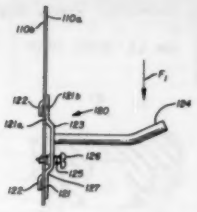
(B) said plate having a through screw receiving aperture located between said panel engaging hooks;

(C) a self-threading, tapered screw having a relatively deep thread;

(D) said screw being adapted to pass through said screw receiving aperture of said plate and into one of the perforations of the support panel and engage the periphery of the perforation when said panel engaging hooks are in engagement with the panel;

(E) said plate having top and bottom portions and a central support portion offset therefrom and disposed in a plane parallel to the plane of the front surface thereof;

(F) said central support portion having a length approximating one half the overall length of said plate; and



(G) said screw drawing the rear surfaces of said top and bottom portions into engagement with the panel and said central support portion toward the panel upon engagement with the periphery of the panel perforation, and

(H) said screw receiving aperture being disposed in said offset portion of said plate.

4,441,620

HEATSEAL PLUG WITH RESEALING FEATURE

Joel A. Tune, Lake Villa, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 28, 1982, Ser. No. 392,681
Int. Cl.³ B65D *41/32*
U.S. Cl. 215—232 **6 Claims**

1. An improved hermetically sealed container and closure assembly for storing and dispensing sterile liquids, said container including a bottle having a neck which includes an outlet or mouth, a set of external threads adjacent said outlet, and a transverse abutment shoulder on the neck and spaced from said outlet; said closure including an externally threaded cup-shaped overcap having a generally cylindrically shaped side wall, a top wall for positioning across said bottle outlet and wiper means depending from said top wall for sealing cooperation with said outlet, said cap being hermetically bonded to said bottle neck; and said closure also including an outer jacking ring threadedly interfitting over said overcap and adapted for counterclockwise downward rotation to engage said abutment shoulder and cause said overcap to move axially upwardly from said bottle outlet;

wherein the improvement comprises there being provided:

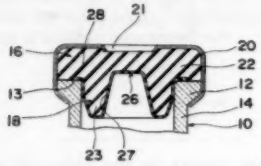
ramp-like cam means on said neck for cooperation in sealing said wiper means to said bottle outlet; and

shoulder means on said overcap for engaging said ramp-like cam means, causing said overcap to distort and thereby enhancing the sealing of the wiper means to said outlet.

4,441,621
PIERCEABLE CLOSURE MEMBER FOR VIAL

Yoshiharu Matukura, Ikoma, and Denpei Sudo, Sumida, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka and Daikyo Gomu Seiko, Ltd., Tokyo, both of, Japan

Filed Aug. 16, 1982, Ser. No. 408,717
Claims priority, application Japan, Aug. 24, 1981, 56-125792[U]
Int. Cl.³ B65D *39/00*
U.S. Cl. 215—247 6 Claims

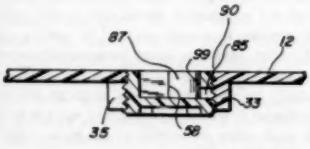


1. A pierceable closure member for use on a vacuum filled vial, which vial includes a beaded mouth having an annular flat face on the bead of the mouth, said closure member comprising a generally disc-shaped rubber plug made of butyl rubber and having an annular leg protruding from one end surface thereof in concentrical relation thereto and also an annular protrusion protruding from said one end surface thereof in concentrical relation to said annular leg, and a generally disc-shaped lamina made of fluorocarbon resin and having an annular recess defined therein, said lamina being secured to the rubber plug with the annular recess receiving the annular leg therein, said rubber plug having a thickness within the range of 2 to 10 mm, said annular protrusion having a width within the range of 0.2 to 6.0 mm and protruding a distance H within the range of 0.1 to 3.0 mm, said annular protrusion being so located on the annular surface area of the rubber plug, which is delimited by the difference between the diameter of the rubber plug and the maximum outer diameter of the annular leg, that the distance S between the point of contact of the annular protrusion to the annular flat face and the point on the boundary between the annular peripheral portion of the lamina, which is delimited by the difference between the diameter of the lamina and the maximum outer diameter of the annular portion of the lamina where the annular recess is defined, which distance S is measured in the radial direction of the closure member, is within the range of 1 to 10 mm, the ratio of the distance H relative to the distance S being within the range of 0.1 to 0.5.

4,441,622
THREADED PORT AND PLUG HAVING ACCESS APERTURES

John W. von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648

Continuation-in-part of Ser. No. 141,398, Apr. 18, 1980, Pat. No. 4,280,976. This application Nov. 20, 1980, Ser. No. 208,673
Int. Cl.³ B65D *39/00*
U.S. Cl. 217—99 3 Claims

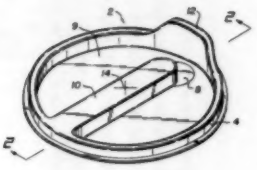


1. An improved container comprising, in combination, a top lid having a port defined by an internally threaded cylindrical sleeve projecting downwardly into said container from said lid, a first radial passage formed in said sleeve, an externally threaded cylindrical plug positioned in said sleeve in threaded engagement therewith for sealing said port when said plug is rotated to a sealing position, the upper end of said plug including a cylindrical outer wall within which is provided a well-like recess open at its upper end, and a second radial passage formed through said plug outer wall in communication with said well-like recess, said second passage being located so it is aligned with said first passage when said plug is rotated to a first open position thereby permitting liquid within said container to flow into said well-like recess if said container is full, and said plug being rotatable to a second closed position where said first and second passages are out of alignment thereby closing said first and second passages.

4,441,623
RESILIENT CLOSURE

Nickolas J. Antoniak, 896 W. 15th Ave., Vancouver, British Columbia, Canada V5Z 1R7

Filed Jun. 17, 1982, Ser. No. 389,310
Int. Cl.³ B65D *41/26*
U.S. Cl. 220—90.4 5 Claims



1. A resilient closure to be received on a container for a liquid, the closure comprising;

a raised periphery defining a channel to engage on the container to form a seal around the container;

a valve in the surface of the closure adjacent the raised periphery and movable between a closed and an open position but tending to remain closed in the absence of an external force;

a lever formed integrally with the closure and raised above the surface, extending generally from the periphery diametrically opposed to said valve across the surface and ending generally adjacent the valve whereby downward pressure applied to the lever opens the valve to allow liquids to pass from the container but release of the lever allows the valve to return to the closed position.

the valve comprising a slit in the surface of the closure starting at and extending away from an edge of the lever,

the valve comprising a flap forming a portion of the circumference of a circle arranged around the end of the lever, the flap being defined by the slit extending away from an edge of the lever, around but spaced from the end of the lever to meet the lever at a second edge of the lever, the flap being attached to the closure at a joint contiguous with the end of the lever.

4,441,624
DRINKING COVER

Bronislaw Sokolowski, 44 Aldrich St., Webster, Mass. 01570

Filed Jan. 20, 1983, Ser. No. 459,412
Int. Cl.³ B65D *41/26, 47/04*
U.S. Cl. 220—254 18 Claims

1. Cover for a beverage container having an annular upper rim, said cover comprising:

(a) a circular top wall having a peripheral edge, said edge having a front portion and an opposite rear portion, said top wall having an opening which is near the front portion of said edge and spaced from said edge,

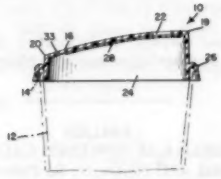
(b) an annular side wall which extends downwardly from said edge, the top of said side wall gradually tapering downwardly from said front portion to said rear portion

so that the top wall gradually tapers downwardly from said front portion to said rear portion,

(c) sealing means on the bottom periphery of the side wall for securing the cover to the rim of the container, and

(d) a sealing flap which underlies said opening and which is attached to the inner surface of the top wall, the flap being movable from a closed position in which the flap seals the opening to an open position in which the flap is in a non-sealing relationship with the opening, the top wall being made of a flexible material and the sealing flap being attached to the top wall at a limited area which is spaced from the opening, so that the flap is free to pivot about said limited area to move from said closed position to said open position upon application of downward force against said top wall, wherein the inner surface of the top wall is normally concave, and the flap is sufficiently flexible to conform to the curvature of the said inner surface of the top wall and in contact therewith, so that the flap is parallel with the top wall in said closed position.

10. Cover for a beverage container having an annular upper rim, said cover comprising:



(a) a circular top wall which is made of flexible material and which has an annular peripheral edge, said edge having a front portion and an opposite rear portion, said top wall having an opening which is near the front portion of said edge and spaced from said edge, the inner surface of said top wall being axially outwardly curved,

(b) an annular side wall which extends downwardly from said edge,

(c) sealing means on the bottom periphery of the side wall for securing the cover to the rim of the container, and

(d) a sealing flap which unlerlies said opening and which is attached to the said inner surface of the top wall intermediate the front and rear portions, so that the flap is movable from a closed position to an open position relative to the opening, said flap normally occupying said closed position and is movable to said open position upon application of downward pressure on the top wall, said top wall being capable of deflecting axially inwardly upon application of pressure to said top wall adjacent said opening thereby causing said flap to pivot about its location of attachment to said top wall and causing said open position.

4,441,625

PACKAGE HAVING A RESEALING DEVICE

Börje Andersson, Lund, Sweden, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

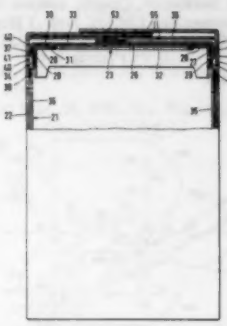
Filed Nov. 9, 1981, Ser. No. 319,501

Claims priority, application Sweden, Nov. 18, 1980, 8008063

Int. Cl.³ B65D *51/20*

U.S. Cl. 220—257 **11 Claims**

1. A package comprising a gas-tight, flexible three-dimensional envelope having opposite end areas and side walls forming an interior and a resealable device at one of said end areas and disposed within the interior of said envelope, said resealable device including a rigid frame assembly including side walls affixed to the interior of said side walls of said envelope and a resealable cap engaging said rigid frame, characterized in that said envelope has top wall tightly covering said resealable device in a gas-tight condition with a portion of said side walls of said frame juxtaposed a tear strip carried by said envelope



which tear strip removes the top wall of said envelope from the side walls of said envelope to expose said resealable cap.

4,441,626

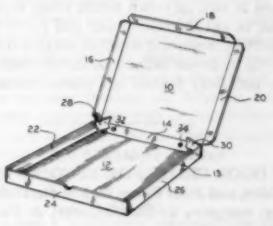
PIZZA BOX

Robert E. Hall, Wheaton, Ill., assignor to Fidelity Grafcor, Inc., Elk Grove Village, Ill.

Filed Dec. 14, 1981, Ser. No. 330,674

Int. Cl.³ B65D *81/24, 81/26*

U.S. Cl. 220—443 **9 Claims**



1. A box comprising upper and lower members which close or open relative to each other to form a covered box, a bottom of said box being formed by said lower member and comprising three laminated layers, a first and outside one of said three laminated layers forming a supporting layer having a first and substantially flat surface on its interior side, a second and intermediate one of said three laminated layers extending over at least a substantial portion of said first flat interior surface, said second layer comprising barrier layer means resistant to at least moisture and being spread across the said first flat interior surface, a third and inside one of said three layers having a second and substantially flat surface on its lower side with a plurality of spaced parallel flutes upstanding on its upper side, said first and second flat surfaces being bonded together in a face to face relationship with said barrier layer means interposed therebetween, said flutes comprising a plurality of upwardly directed ridges defining therebetween upwardly directed open channels, said ridges forming means for supporting an article above the bottoms of said channels, and venting means formed in said box and located in a side wall of said box at the ends of said channels, the dimensions of said box being such that heat from an article resting on said flutes escapes through said ventilation means via said channels.

4,441,627

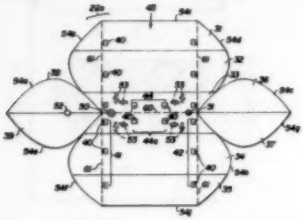
BAG SYSTEM FOR TRANSPORTATION OF BULK LIQUIDS

Seiji Takeuchi, Burlington, Canada, assignor to Don Fell Limited and Lawrence Fell Limited, both of Hamilton, Canada

Filed Feb. 19, 1981, Ser. No. 235,836

Int. Cl.³ H05B *3/68*

U.S. Cl. 220—461 **7 Claims**



1. A bag of tough, flexible sheet material for mounting in a standard freight container to transport a liquid in bulk, said bag having a central, generally cylindrical, elongated portion extending into curved end portions and being liquid tight except for controlled access means for filling and emptying the bag, including a series of substantially uniformly spaced-apart tie down means secured to said material, said tie down means being arranged in a pair of circumferential rows extending around the periphery of the central portion near each end portion and in a further pair of parallel rows extending longitudinally adjacent each other along the central portion between said circumferential rows, each of said tie down means being independent of every other one of said tie down means whereby to permit unrestrained expansion of the bag, the arrangement of said tie down means being such that after use the bag can be cut to remove said end portions and to slit it longitudinally between said adjacent parallel rows to provide a sheet with the tie down means substantially uniformly disposed around the periphery thereof in a manner suitable for use as a tarpaulin.

4,441,628

TRAP DOOR CHUTE FOR VENDING MACHINES

Bernd Mehlan, and Josef Bayer, both of Herrieden, Fed. Rep. of Germany, assignors to Sielaff GmbH & Co., Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,426

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040089

Int. Cl.³ G07F *11/06*

U.S. Cl. 221—90 **14 Claims**

1. A trap door chute for a vending machine comprising:

a plurality of spaced doors pivotally hinged at one end to a chute wall of the machine, each door having a finger extending from an opposite end thereof;

a rake having a plurality of tines made of spring material each forming an elastic detention member in the machine for supporting each of said fingers, with their associated door in a storing position;

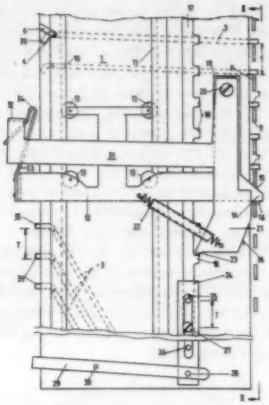
at least one vertical track in the machine extending substantially across a range of said spaced doors;

a carriage mounted for movement along said track;

a cam on said carriage for deflecting each detention member as said carriage moves along said track to release each supporting finger and allow each associated door to fall into a non-supported position;

a lifting bar extending substantially parallel to said track, vertically movably mounted in the machine, said lifting bar having a plurality of teeth with a spacing corresponding to a smallest spacing between said doors;

a pawl on said carriage engaged with one of said teeth to support said carriage in a position below which said cam deflects a next higher detention member; and



a stop on said carriage for supporting said carriage on a detention member below said next higher detention member.

4,441,629

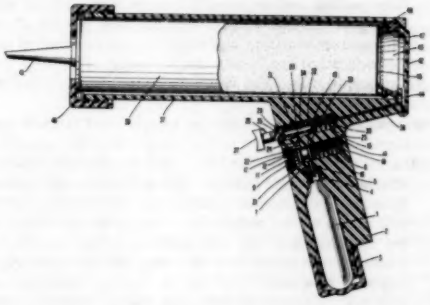
COMPRESSED GAS POWERED CAULKING GUN

Glenn H. Mackal, 4923 59 Ave. S., St. Petersburg, Fla. 33702

Filed Aug. 10, 1982, Ser. No. 406,951

Int. Cl.³ B65D *88/54*; B67D *5/42*

U.S. Cl. 222—324 **6 Claims**



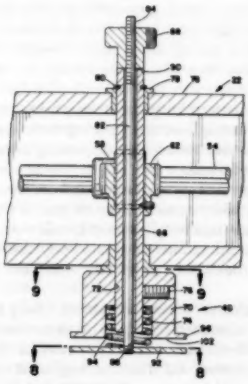
1. A pressure reducing and safety discharge valve device adapted for use with compressed gas-containing capsules, comprising a valve body having a first bore therein, a first spool-shaped valve element in the first bore reciprocable axially within the bore, the first valve element having disc-shaped transverse first and second flanges on its opposite ends and an intermediate portion between the flanges of reduced diameter, annular means on the respective flanges having sealing and sliding engagement with the wall of the first bore, resilient means constantly urging the valve element in a first direction toward a first, terminal position thereof wherein the first flange on the valve element lies adjacent a first end of the first bore and the second flange lies remote from the said first end of the first bore, a first conduit means including a first, fluid pressure feeding port in the wall of the first bore disposed to discharge fluid under pressure from a gas-containing capsule into the space within the bore at a location between the flanges on the valve element when the movable valve element is in its first, terminal position, a second, fluid discharge port in the wall of the first bore disposed between the flanges on the valve ele-

ment when the valve element is in its first, terminal position, and a third, fluid pressure relief port in the wall of the first bore disposed axially in the second direction beyond the other, second flange of the valve element when the valve element is in its first, terminal position, when the valve element is in its first terminal position the distance between the axial distance between the first flange thereof and the second port is substantially less than the axial distance between the second flange and the third port, whereby when the pressure of the fluid medium entering the first port is from zero to a moderate value the valve element does not move from its first, terminal position and gas is delivered from the valve through the second port, but when the pressure of the gas being fed through the first port exceeds a predetermined desired value the valve element is first moved away from its first, terminal position to cut off fluid communication between the first and second ports, and if the pressure of the fluid medium being fed through the first port continues to rise the valve element moves further in the second direction so that communication is established between the first and third ports, whereby to provide fluid pressure relief discharge of the fluid medium through the third port.

4,441,630
ROTARY HEAD TRAY DROPPER

Robert L. Sauer, 5826 W. Glenn Dr., Maple Heights, Ohio 44137

Filed Apr. 28, 1981, Ser. No. 258,416
Int. Cl.³ B65G *59/06*
U.S. Cl. 221—297 **9 Claims**



8. In a rotary gravity feed tray dropper having a frame, a tray storage rack mounted on said frame, and dispenser means mounted on opposite sides of said tray storage rack adapted to separate a bottom tray from a stack of nesting trays placed in said storage rack, the improvement in said dispenser means comprising:

a shaft concentrically fitted within a tubular housing and adapted to project from opposite ends of said tubular housing;

a hand knob threadedly engaging said one end of said shaft;

a truncated disc secured to the other end of said shaft;

a wedge positioned between said tubular housing and said truncated disc and secured to said tubular housing for rotation therewith;

said wedge being arcuately positioned away from the truncated portion of said disc;

resilient means to bias said disc vertically away from said wedge;

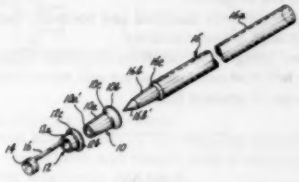
said hand knob being rotatable to adjust the vertical space between said wedge and said disc;

and means to concentrically rotate said wedge and said disc in unison whereby trays having edges of different lip thicknesses may be readily accommodated between said wedge and said disc by adjustment of said hand knob.

4,441,631
OPENER AND POURING SPOUT WITH HOLDER FOR FLEXIBLE WALL CONTAINERS

Alistair M. Hosie, 219 Superior St., Victoria, British Columbia, Canada V8V 1T4

Filed Mar. 24, 1982, Ser. No. 361,424
Int. Cl.³ B67B *7/26*
U.S. Cl. 222—86 **10 Claims**

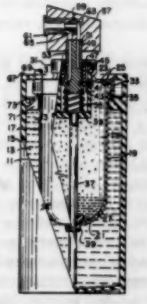


1. An installation kit assembly for an opener and pouring spout to be used with flexible, perforable wall liquid containers, and the like, said assembly including mutually interengageable members including an annular inner member having a first end insertable outwardly of the container through an opening punched for the purpose in a first side wall of said container so as to project in a snug fit outwardly through said opening with the inner member operably positioned, said inner member having an annular shoulder adapted to bear against the inside of said wall around said opening, and an outer member having an annular portion formed to closely encircle the projecting portion of the inner member and retentively interengage the same adjacent said shoulder, said outer member having an annular shoulder formed complementally to the inner member shoulder so as to clamp the container wall around said opening between said shoulders with the members interengaged, and a hand-held, elongated carrier having a tip portion adapted to hold the inner member thereon and advance the same into operable position through the wall of the container opposite said first wall, said elongated carrier being thereupon removable by withdrawal from said inner member.

4,441,632
SOFT SHELL AEROSOL DISPENSER UNIT

William R. Stoody, 8659 Summerdale Rd., San Diego, Calif. 92126

Filed Dec. 3, 1981, Ser. No. 326,667
Int. Cl.³ B67D *5/56*; B65D *83/06*
U.S. Cl. 222—129 **6 Claims**



1. A self-contained aerosol type dispenser comprising a

container, wherein atmospheric pressure is maintained, holding a product fluid to be dispensed;

a motivating gas vessel suspended within said container;

said vessel containing pressurizing fluid, and including an operable valve means for dispensing said product fluid;

and passageway means for separate flow of said product fluid into said valve means;

said valve means being adapted to initiate discharge flow of said pressurizing fluid, and utilize said flow to effect discharge flow of said product fluid;

said vessel mounted in cooperative valvular engagement with said container for controllable admittance of ambient air into the container;

said vessel resiliently mounted and normally biased to provide closure of said container;

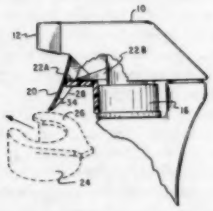
said vessel being reciprocatively movable to allow air entrance into said container when said valve is operated for discharge of product fluid.

4,441,633

CHILD RESISTANT TRIGGER PUMP

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Oct. 26, 1981, Ser. No. 314,782
Int. Cl.³ B05B *11/00*
U.S. Cl. 222—153 **6 Claims**



1. A device for use with a manually operable trigger pump having a pump body and a circular cap disposed below the body and adapted to engage a container having material to be pumped out by said pump, said pump having a generally vertical trigger pivotally coupled at its upper end to said body and a linkage coupled at one end to said trigger at a point intermediate the ends of the trigger, said trigger having a surface adjacent said body, said surface having a longitudinally extending groove therein, said linkage extending from said coupled end into said body, said linkage being moved into said body when said trigger is pivoted in a vertical plane toward said body to operate said pump, said device comprising:

locking means detachably securable to the outer surface of said cap in such manner as to be manually rotatable about said cap; and

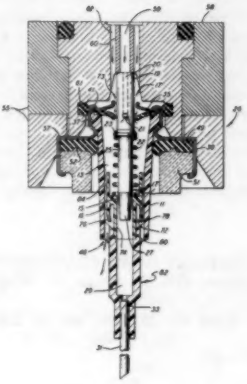
a generally horizontal arm integral at one end with said locking means and when said means is secured to the cap extending radially outward from said cap, the other end of said arm having a tip engageable with and disengagable from said trigger surface groove, said means when secured to said cap being rotatable to a locked position at which the tip engages said groove and the pivotable motion of said trigger toward the pump body is small enough to prevent trigger operation of the pump, whereby the pump is locked into an inoperative position, said pump being unlocked and in operative position when the trigger is pivoted in the opposite direction and the locking means is simultaneously rotated to move the tip out of engagement with the trigger surface whereby the trigger can be pivoted in normal operative manner.

4,441,634

DISPENSER ADAPTED FOR FAST PRESSURE FILLING

Philip Meshberg, 2500 S. Ocean Blvd., Palm Beach, Fla. 33480

Filed Jan. 13, 1982, Ser. No. 339,046
Int. Cl.³ B65D *83/14*; G01F *11/02*
U.S. Cl. 222—402.16 **6 Claims**



1. In a pressurized dispenser comprising: a container; a mounting cup having a central opening therein, said mounting cup attached to said container; a dispensing means comprising a body member forming a tank and having an open top portion and a dispensing stem projecting therefrom through said central opening in said mounting cup and spaced from said opening to form a gap, said body retained in said mounting cup; and a diaphragm interposed between said body and said mounting cup, sealing around said projecting stem, the improvement comprising:

(a) a body member forming a chamber axially inward of said tank, said chamber having a diameter smaller than the diameter of said tank, said tank thereby having a bottom at the point where said chamber begins, at least one hole formed in said bottom radially outward of said chamber thereby forming a path to the inside of the container;

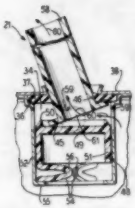
(b) a piston-like member inserted into said tank extending to the bottom thereof, said piston-like member having a flange extending axially inward terminating in a sealing lip sealing against the side of said tank at said bottom, said flange being radially flexible at said sealing lip, and an annular portion radially inward of said sealing lip forming a throat, said dispensing stem extending through said throat; and

(c) a cylindrical member concentric with said flange sealed to and extending axially inwardly from said throat and engaging said chamber in a sealing manner so as to seal off an annular space between said flange and said cylindrical member, which space is in communication with said at least one hole, whereby during pressure filling, a gas admitted through the opening in said mounting cup and around said stem will flex said diaphragm, flow into said tank, and flex said flange radially inwardly to move said sealing edge from the side of said tank permitting flow through said at least one hole into the inside of the container.

4,441,635
DIRECT HIGH FLOW AEROSOL-TYPE VALVE WITH MOVEABLE CUP

Walter C. Beard, South St., Middlebury, Conn. 06762

Filed Nov. 1, 1982, Ser. No. 438,212
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—402.22 10 Claims



1. A fluid dispensing valve structure for dispensing the viscous contents of a pressurized container comprising:

a valve mounting cup peripherally sealingly securable to said pressurized container and having wall portions defining an interior valve receiving chamber with a central upper aperture defined therein;

a resilient seal member positioned around and radially adjacent said aperture in said valve receiving chamber;

an elongated tubular nozzle means having a dispensing orifice in one end thereof and having a second opposed and radially outwardly flanged end extending through said central aperture and yieldingly sealingly supported by said resilient seal member in a normally generally straight upright extended position relative to said valve mounting cup;

a moveable valve cup means reciprocally longitudinally slidably carried within said valve receiving chamber and normally biasable against said resilient seal member to form a seal means for normally sealing the contents of said container, said moveable valve cup member being engageable with said second end;

said contents of said pressurized container being dispensable when said one end is tiltably displaced relative to said generally straight upright extended position by an external deflecting operating force applied thereagainst, thereby opening said seal means;

said moveable valve cup member including:

(A) a valve plate portion position to extend across said second end having perimeter regions,

(B) annular rib means upstanding from valve plate portion for engaging said resilient seal member peripherally of said second end, and

(C) sidewall means for slidably guiding said moveable valve cup member relative to said wall portions in said valve receiving chamber during said reciprocal sliding movements;

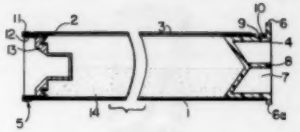
aperture means defined in said side wall portions generally axially adjacent said resilient seal member and generally radially adjacent said second end for passage of said viscous contents therethrough to said second end in a generally radial direction relative to said wall portions;

the interrelationship between said moveable valve cup means, said tubular nozzle means, said resilient seal member, and said mounting cup member being such that a substantially unobstructed flow of said contents through said valve structure and across said base portion occurs when said one end is so tiltably displaced.

4,441,636
TONER CARTRIDGE

Keitaro Yamashita, Saitama, and Hiromi Kashiwagi, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,645
Claims priority, application Japan, Jun. 23, 1981, 56-97059
Int. Cl.³ B65D *47/10*
U.S. Cl. 222—541 2 Claims



1. A toner cartridge comprising:

a cylindrical hollow body of nonmagnetic material providing on a peripheral wall thereof with a toner feeding slot extending lengthwise;

a first closing member fitted to one end of said hollow body and having a flange portion on the outer peripheral surface at the end portion thereof;

a second closing member fitted to the other end of said hollow body and having a toner introduction port therein;

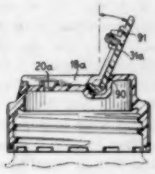
a plug member closing said toner introduction port; and

a sealing member peelably sealing said toner feeding slot; wherein said second closing member is formed of a thin metallic sheet, one end portion of said second closing member is folded back so as to define a gap having a small radial width between the folded end portion and the outer peripheral surface of the second closing member, and said the other end of the hollow body is inserted into said gap and secured to said second closing member.

4,441,637
DISPENSING TYPE CAP CLOSURE

Sidney M. Libit, 141 Lakeside Ter., Glencoe, Ill. 60022

Continuation-in-part of Ser. No. 264,129, May 15, 1981. This application Dec. 1, 1981, Ser. No. 326,416
Int. Cl.³ B65D *47/00*; B67D *3/00*
U.S. Cl. 222—556 11 Claims



1. A dispensing closure comprising a cap portion having a top surface, a socket portion recessed in said top, a dispensing opening through said top spaced from the socket, said socket having a forward wall portion and side wall portions, a closure member having a rear depending flange and a depending stopper spaced from the flange for closing the opening, a pivot connection between the closure member and the cap, the closure member movable about the connection from a first position with the stopper closing the opening to a second position with the stopper elevated above the top surface, the closure member rotating in excess of 90° rotation from the first position to the second position, the flange moving within the socket during the said rotation, opposing engaging means on the socket forward wall portion and on the closure member flange engaged by rotational movement of the flange for retaining the closure member in the second position, the engag-

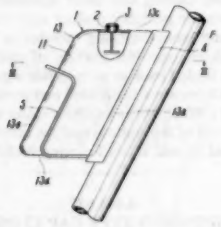
ing means comprising at least one stationary projecting boss on the forward wall extending rearwardly into the socket beyond the forward wall and engageable with an end portion of the flange upon rotational movement of the flange towards and away from the second position, the engagement upon rotational movement of the flange providing resistance to movement of the closure member relative to the cap portion both to the second position from adjacent the first position and towards the first position from the second position whereby the closure portion may be retained in the second position.

4,441,638

WATER BOTTLE FOR A BICYCLE

Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 248,200, Mar. 27, 1981, abandoned.
This application Feb. 28, 1983, Ser. No. 470,069
Claims priority, application Japan, Mar. 31, 1980, 55-43862[U]
Int. Cl.³ B62J *11/00*
U.S. Cl. 224—35 **3 Claims**



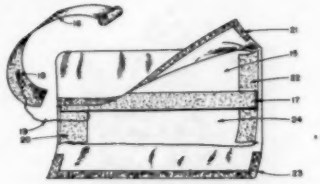
1. A water-bottle for a bicycle, which is mounted on a down tube of a bicycle frame by a fixing member which permits easy removal of the water-bottle; said down tube having a surface in the form of a circular arc, said water-bottle comprising a body having a spout, and a stopper for opening and closing said spout, said body being provided with a pair of side walls spreading longitudinally and vertically and a connecting wall in continuation of and connecting said side walls, said connecting wall being provided with a front surface portion extending along said down tube and a rear surface portion facing rearwardly of the bicycle, said body having between said sidewalls a narrow thickness defined by said connecting wall, said narrow thickness being less than or equal to a dimension which is slightly larger than an external dimension of said down tube forming with said down tube a streamlined structure having a reduced air resistance, said fixing member having a housing portion in which said front surface portion of said watter-bottle is contained and a retainer for permitting removal of said water-bottle from said housing portion without removing said housing portion from said frame, said housing portion covering a gap between the front surface of said water-bottle and said down tube to reduce air resistance, said connecting wall including an upper surface portion and a lower surface portion, the upper and lower surface portions continuing with said rear surface portion through respective curved surfaces, said upper surface portion and lower surface portion being made horizontal and said front and rear surface portions being inclined and in parallel with each other and with said down tube, said front surface portion being connected to said upper and lower surface portions.

4,441,639

QUICK-RELEASE AND QUICK-DEPLOY CONTAINER FOR EMERGENCY EQUIPMENT

Craig A. Craw, and Carol S. Craw, both of 911 Kaluanui Rd., Honolulu, Hi. 96825

Filed Aug. 27, 1982, Ser. No. 412,299
Int. Cl.³ A45F *3/04*; B64D *17/52*
U.S. Cl. 224—237 **3 Claims**



1. A container for emergency equipment such as an inflatable life raft comprising a single unitary piece of flexible sheet material formed with a back panel, a top flap, a bottom flap and a pair of side flaps, a separate and loose inner strip, an outer strip and a lanyard,

said flaps being of a size and configuration such that when all four said flaps are folded over said back panel, said flaps' edges do not meet but form a rectangular slot outlined by said flaps' edges,

said flap edges and said inner strip being covered on both exterior and interior facing sides with mating hook and burr Velcro-like material and said outer strip having mating hook and Burr Velcro-like material on the interior facing side, wherein said flaps and strips may be engaged in a mating relationship to form a closure for said container such that when said side flaps are positioned interiorly of said inner strip, said top and bottom flaps and said outer strip, and said inner strip is positioned exteriorly of said side flaps and interiorly of said top and bottom flaps and said outer strip, said top and bottom flaps are folded over said back panel and are engaged in a mating relationship to said side panels and said inner strip by hook and burr Velcro-like material, and said outer strip is engaged in a mating relationship to the exterior of said top, bottom and side flaps and said inner strip to provide a multiple layer seal of hook and burr Velcro-like material to restrain said contents, but to only lightly retain the contents when the outer strip is removed,

said lanyard is connected on the inside of one end of said outer strip and the other end of said lanyard may be attached to a bottle of compressed air for inflating a life raft such that when the outer strip is ripped off, the lanyard is pulled and air is released into the life raft which will burst said container thus effecting quick deployment of the emergency equipment.

4,441,640

NON-SPILLABLE DRINKING CONTAINER

Edward A. Lottick, 41 Gershom Pl., Kingston, Pa. 18704

Filed Mar. 30, 1983, Ser. No. 480,565
Int. Cl.³ A45F *5/02*; B65D *83/00, 23/00, 51/24*
U.S. Cl. 224—252 **33 Claims**

1. A non-spillable liquid drinking container, comprising:

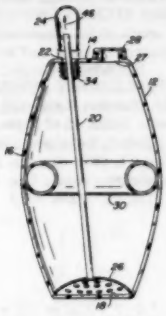
a container having a substantially flat surface and provided with at least one opening therethrough substantially opposite said flat surface;

a tube mounted at least partially within said container and including means for engagement by the lips of a consumer extending outside of said container for a predetermined distance through said opening in said container;

sealing means for providing a seal between the outer surface of said tube and the opening through said container and allowing movement of said tube in a direction toward or

away from said substantially flat surface of said container; and

an expandable diaphragm mounted to the tube in proximity to the end of the tube juxtaposed a substantially flat surface of said container, the periphery of said diaphragm



being mounted to said container, said diaphragm being provided with perforations therethrough which are normally closed in the unexpanded state of said expandable diaphragm and which are open when said expandable diaphragm is stretched by movement of said tube away from said substantially flat surface of said container.

4,441,641

AUTOMOBILE ROOF MOUNTING BRACKET AND CARTRIDGE HOLDER ASSEMBLY

Arthur M. Thompson, 12 Waterside Ave., Northport, N.Y. 11768

Continuation of Ser. No. 299,463, Sep. 4, 1981, abandoned. This application Mar. 18, 1983, Ser. No. 476,884

Int. Cl.³ B60M *7/08*; B60R *7/04*

U.S. Cl. 224—311 **8 Claims**

1. An automobile tape cartridge holder assembly comprising: a bracket comprising two resiliently flexible elongated planar members having means disposed at one end portion of each for connecting the two members colinearly and for adjusting of the overall length of the colinear members and wherein one member has first blade means disposed at the other end thereof for sliding between an automobile inside roof and its windshield rim and the other member has second blade means disposed at the other end thereof for sliding between an automobile inside roof and an overhead light fixture attached thereto; a housing; and means mounting the housing on the bracket to effect the overhead support of the housing in an automobile, comprising means slidably receiving the one end portion of one of the two members before connection to the other of the two members by the connecting means.

4,441,642

CORE HOLDER AND DISPENSER

Henry Finkel, Westmount, Canada, assignor to Stanbel Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 282,274, Jul. 10, 1981. This application Jun. 21, 1982, Ser. No. 390,354

Claims priority, application Canada, Aug. 11, 1981, 383632

Int. Cl.³ B26D *1/02*

U.S. Cl. 225—46 **26 Claims**

18. A dispensing package for elongated strands, such as cord, thread, yarn or the like, wound on a spool;

said package comprising:

a rigid but flexible material;

a floor member and a parallel ceiling member spaced from said floor member by wall means;

said wall means comprising at least two walls at an angle to each other and joined to each other at a common edge thereof;

an opening in said wall means;

said opening being located in the common edge area of said wall means; and

blade holder means extending in said opening.

4,441,643

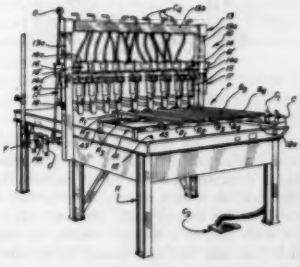
PALLET-FORMING APPARATUS

Norman L. McCutchen, Lake Mills, Iowa, assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 29, 1982, Ser. No. 343,821

Int. Cl.³ B27F *7/09*

U.S. Cl. 227—110 **6 Claims**



1. An apparatus for forming a pallet having a plurality of elongated runners arranged in spaced substantially parallel relation and subtending a plurality of elongated deck boards arranged in spaced substantially parallel relation and extending transversely of the runners and spanning the distance therebetween; said apparatus comprising a substantially horizontal surface for supporting thereon a plurality of the runners with the deck boards overlying the latter; an elongated support member disposed in spaced overlying relation with respect to a predetermined elongated area of said surface; a plurality of power actuated fastener-driving means mounted on and depending from said support member, said driving means being arranged in spaced side-by-side relation and forming an elongated row, said row being in spaced, overlying substantially

parallel relation with the predetermined elongated area of said surface and with a runner when the latter is disposed at said predetermined surface area, said plurality of driving means and at least a portion of said support member being selectively movable as a unit relative to said surface between operative and inoperative modes, when in an operative mode, said plurality of driving means being adapted to engage and secure corresponding segments of the deck boards to a subtending runner disposed at said predetermined surface area, when in an inoperative mode, said plurality of driving means being elevated and out of contact with the runner supported deck boards; adjustable stop means disposed adjacent said predetermined surface area and mounted for selective movement relative to said surface between projected and retracted positions, when in a projected position, said stop means being engaged by a runner disposed at said predetermined surface area and preventing further movement of the runner in one direction along the surface, and when in a retracted position, said stop means being out of engagement with the runner disposed at said predetermined surface area; adjustably mounted runner-retaining means coacting with said stop means when in a projected position, to effect retention of a runner against said stop means, when said driving means is in said operative mode; and means coacting with said stop means and said runner-retaining means for effecting relative movement thereof in a predetermined time sequence.

4,441,644

BUFFER SYSTEM FOR FASTENER DRIVING DEVICES

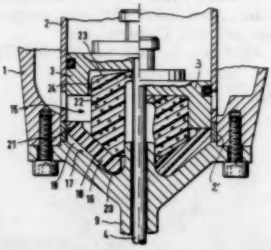
Gerhard Farian, Grossbettlingen, Fed. Rep. of Germany, assignor to Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,194

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047662

Int. Cl.³ B25C *1/04*

U.S. Cl. 227—130 **7 Claims**



1. A buffer system for fastener driving devices having a driving piston guided in a driving cylinder and operated by air under pressure, comprising a first buffer element (16) having a radially inner portion resting on a bottom surface (20) of said driving cylinder (2), a second buffer element (22) arranged for cooperation with said first buffer element for performing a damping function, said first and second buffer elements being made of materials having different hardnesses such that the first buffer element is made of a hard elastic material while the second buffer element is made of a relatively soft elastic material, said first buffer element (16) further having a radially intermediate portion including a surface area (18) normally spaced from said bottom surface of said driving cylinder for normally providing a spacing (19) between said surface area (18) of said first buffer element (16) and said bottom surface of the driving cylinder, at least a part of said intermediate portion of said surface area of said first buffer element being arranged to be movable relative to said bottom surface of said driving cylinder, said first buffer element further having a radially outer portion (21) resting with a radially outwardly directed bias force against an inner surface of said driving cylinder above said bottom surface to provide for said spacing, wherein said first buffer element (16) performs its damping function in two phases, so that, in response to an impact by said driving piston on said second buffer element (22), the first buffer element first causes energy dissipation by friction between said radially outer portion (21) and said inner surface of said driving cylinder until said spacing (19) disappears whereupon the first buffer element causes further energy dissipation as a result of its inner deformation.

4,441,645

AUTOMATIC VEHICLE-BODY ASSEMBLING SYSTEM

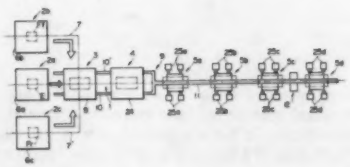
Haruyoshi Takagishi, Yamato; Kazuyoshi Kamio, Yokohama, and Tsuneo Fujikawa, Ebina, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 11, 1981, Ser. No. 329,873

Claims priority, application Japan, Dec. 16, 1980, 55-177806

Int. Cl.³ B23K *9/12*

U.S. Cl. 228—47 **5 Claims**



1. An automatic vehicle-body assembling system for automatically welding together an engine compartment assembly, a front floor assembly and a rear floor assembly to constitute a vehicle floor structure of an automotive vehicle, each of the engine compartment and front and rear floor assemblies being composed of a plurality of component members comprising:

first, second and third initial assembling stages for provisionally welding together the component members of said engine compartment assembly, the component members of said front floor assembly and the component members of said rear floor assembly, respectively, for forming a tentative engine compartment assembly, a tentative front floor assembly and a tentative rear floor assembly in the first, second and third initial assembling stages, respectively,

a main assembling line extending forwardly from said first initial assembling stage and including a positioning stage for correctly positioning the engine compartment and front and rear floor assemblies with respect to one another, at least one primary assembling stage for provisionally welding the tentative engine compartment and front and rear floor assemblies together to form a tentative vehicle floor structure, and at least one secondary assembling stage for completely welding together the tentative engine compartment and front and rear floor assemblies and the component members of each of the component assemblies of said tentative vehicle floor structure,

at least two subsidiary assembly lines extending respectively from said second and third initial assembling stages to said positioning stage,

a horizontally extending, reciprocative conveying member adapted to carry thereon said tentative engine compartment assembly, tentative front and rear floor assemblies and tentative vehicle floor structure and having a pair of upstream branch portions horizontally spaced apart in parallel from each other and longitudinally extending through said positioning stage and said primary assembling stage, and a single straight downstream portion merging forwardly between said primary and secondary assembling stages out of said upstream branch portions and longitudinally extending through the secondary assembling stage, and

drive means operative to drive said conveying member for

forward and backward movement along said main assembling line.

4,441,646

PROCESS FOR MANUFACTURING PLASTICALLY DEFORMED LIGHT METAL OBJECTS AND SHAPED BODIES HAVING A LIGHT METAL PART

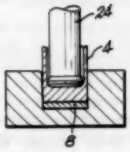
Alfred Wagner, Steisslingen; Adolf Ames, Hilzingen, and Ulf Hodel, Engen, all of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 22, 1981, Ser. No. 256,293

Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017076

Int. Cl.³ B23K *28/02, 20/02*

U.S. Cl. 228—116 **2 Claims**



1. Process for manufacturing plastically deformed light metal objects which are joined permanently to a dissimilar metal component which comprises: providing a light metal blank; providing a dissimilar metal component of steel adjacent said light metal blank; plastically deforming said blank to form a light metal part thereby producing a portion thereof free from interfering oxide; and metallically joining said portion to said dissimilar metal, wherein said steel component is joined to a second steel component before joining to said portion, and wherein said steel component and said portion are joined by friction welding.

4,441,647

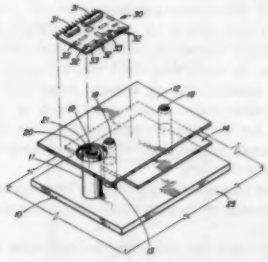
RESOLDERING TOOL FOR CERAMIC SUBSTRATE HYBRID ELECTRONIC CIRCUITS

Gordon J. Holmes, West Palm Beach, Fla., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 4, 1982, Ser. No. 385,050

Int. Cl.³ B23K *1/00*

U.S. Cl. 228—119 **9 Claims**



1. A resoldering tool for reworking ceramic substrate hybrid electronic circuits, comprising:

a heat conductive base;

a support member supported above said base, and an aperture in said support member;

a pillar of heat conductive material attached to said base and extending up therefrom, said pillar extending through said aperture, an upper surface of said support member and an upper surface of said pillar in a common plane, a clearance extending between said pillar and said support member;

said heat conductive base adapted to be positioned on a hot surface, to produce a hot spot at said upper surface of said pillar.

4,441,648

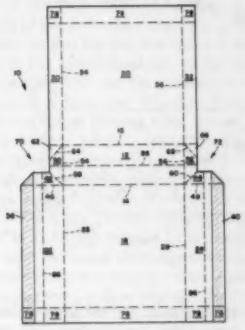
SINGLE PIECE PACKAGING CONTAINER

Joseph P. Portsmouth, White Plains, N.Y., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Apr. 8, 1982, Ser. No. 366,634

Int. Cl.³ B65D *5/06*

U.S. Cl. 229—37 R **8 Claims**



1. A hermetically sealed container formed from a single piece blank of heat sealable material while requiring a minimum number of surfaces to be heat sealed together at any one location, comprising:

a. a horizontal bottom panel;

b. first and second opposed, substantially vertical side wall panels attached through 90° folds to first and second opposed edges of said bottom panel;

c. third and fourth opposed, substantially vertical side wall panels attached through 90° folds to side edges of at least one of said first and second side wall panels, with said first and second vertical side wall panels being attached, adjacent two side corners of the carton, by two vertically extending seal seams to the third and fourth vertical side wall portions;

d. first and second bottom seam flaps attached through 90° folds to the bottom edges of said third and fourth side wall panels and extending along and adjacent to said bottom panel; and

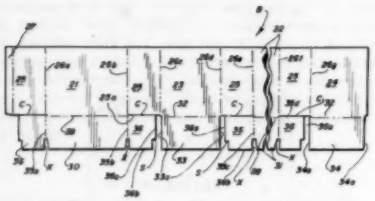
e. third and fourth bottom seam flaps attached through 180° folds to third and fourth opposed edges of said bottom panel and extending along and adjacent to said first and second bottom seam flaps and said bottom panel, with the arrangement comprising said third bottom seam flap being folded over through 180° and overlaying and being sealed directly to said horizontal bottom panel, and said first bottom seam flap being folded over through 90° and overlaying, and at least a major portion of the first bottom seam flap being sealed directly to, the third bottom seam flap, such that a major portion of the seal between the horizontal bottom panel, the third bottom seam flap and the first bottom seam flap is comprised of only three carton surfaces sealed directly together, and no more than four carton surfaces are sealed together over the entire seal, and the arrangement further comprising said fourth bottom seam flap being folded over through 180° and overlaying and being sealed directly to said horizontal bottom panel, and said second bottom seam flap being folded over through 90° and overlaying, and at least a major portion of the second bottom seam flap being sealed

directly to, the fourth bottom seam flap, such that a major portion of the seal between the horizontal bottom panel, the fourth bottom seam flap and the second bottom seam flap is comprised of only three carton surface sealed directly together, and no more than four carton surfaces are sealed together over the entire seal.

4,441,649
COLLAPSIBLE RECEPTACLE

Terril L. Nederveld, Ada, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Sep. 7, 1982, Ser. No. 415,404
Int. Cl.³ B65D *5/10*
U.S. Cl. 229—38 **8 Claims**



1. A collapsible receptacle formed from a blank of foldable sheet material, comprising upright first wall panels; upright second wall panels; upright corner panels, each corner panel being foldably connected to and disposed intermediate adjoining first and second wall panels, said first, second, and corner panels coacting to delimit a predetermined area; bottom-forming first flaps foldably connected to bottom edges of said first wall panels and extending therefrom towards one another into the predetermined area; extension flaps connected to opposite ends of each first flap and extending laterally therefrom, an outer edge of each extension flap being provided with an offset shoulder, corresponding extension flaps being foldable with said first flaps into opposed relation; and bottom-forming second flaps foldably connected to bottom edges of said second wall panels and extending therefrom towards one another into the predetermined area and at least partially subtending corresponding extension flaps; the opposite ends of each folding connection between a second wall panel and a bottom-forming second flap being interposed and in substantially abutting relation with the shoulders formed in corresponding opposed extension flaps.

4,441,650
LAMP PACKAGE

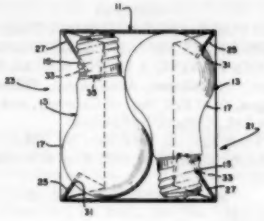
David H. Caldwell, Marblehead, and Robert M. Hurley, Lexington, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 30, 1982, Ser. No. 412,754
Int. Cl.³ B65D *85/42*
U.S. Cl. 229—39 B **18 Claims**

1. A container for a pair of electric lamps wherein each of said lamps includes a bulbous glass envelope, said container comprising:

a parallelepiped of paperboard material for having said lamps positioned therein; and

first and second pairs of lamp-engaging tab members secured to or forming part of said parallelepiped and extending substantially inwardly thereof, each of said pairs of said tab members adapted for acting in a cooperative manner with the other of said pair to positively engage a respective one of said electric lamps at spaced locations thereon to cause said glass envelopes of said electric lamps to be in

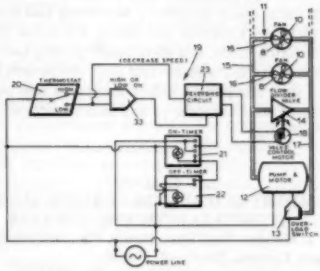


physical contact with each other within said parallelepiped.

4,441,651
HYDRAULIC FAN CONTROL

Terry A. Dill, Keota, Iowa, assignor to Jefferson Industries Company, Fairfield, Iowa

Filed Oct. 29, 1982, Ser. No. 437,887
Int. Cl.³ F24F *7/00*
U.S. Cl. 236—49 **9 Claims**



6. A ventilating system for a poultry or livestock confinement building having a plurality of fans for moving air within the building, said system comprising:

(a) fluid motor means for driving each said fan and corresponding in number to the number of said fans;

(b) means for supplying fluid under pressure to said fluid motor means including a single pump unit;

(c) reversible valve means interposed in said supplying means for variably controlling the flow of fluid to said fluid motor means, said valve means comprised of a rotatable flow divider;

(d) motive means for incrementally opening and closing said valve means in discrete steps comprising sequential timed intervals;

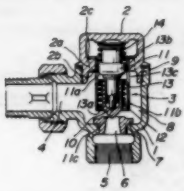
(e) a thermostat for providing an indication when the temperature of the air in said building exceeds or falls short of a predetermined temperature; and

(f) means associated with said thermostat for actuating said motive means to progressively increase the fluid flow to said fluid motor means for sequential time periods during which said air temperature exceeds said predetermined temperature and to progressively decrease the fluid flow to said fluid motors for sequential time periods during which said air temperature is less than said predetermined temperature.

4,441,652
EXCHANGEABLE UNIT STEAM TRAP

Masahumi Minami, Sakai, Japan, assignor to Miyawaki Steam Trap Mfg. Co., Ltd., Osaka, Japan

Filed Feb. 5, 1982, Ser. No. 346,326
Int. Cl.³ G05D 23/12
U.S. Cl. 236—56 3 Claims

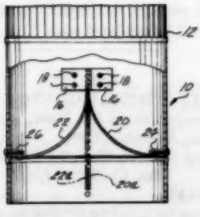


1. An exchangeable unit steam trap comprising; a casing having an inlet, an outlet and a valve opening communicating with said outlet for condensate, a cover detachably secured to said casing to enclose a condensate reservoir in the casing, and a trap unit having a sleeve enclosing therein a valve closing and opening the valve opening in respo.se to temperature in said reservoir, a thermowax element generating a thrust acting upon said valve in response to said temperature and a counter spring whose spring force acts against said thrust of said thermowax element, said sleeve formed at its lower end with an inward flange supporting a lower end of said counter spring whose upper end supporting said valve and, said sleeve is formed at its upper end with a plurality of outward lugs each being formed with a notch, and said cover is formed with an inward flange having alternate ridges and slots which permit said outward lugs to pass therethrough and includes at least one anchoring pin planted in said ridge for engaging said notch of said sleeve to prevent the sleeve from being rotated about its axis when the trap unit is in position, a bayonet connection enabling said cover and said trap unit to be connected only by relative movement therebetween, said bayonet connection comprises lugs formed in said sleeve of the trap unit and slots formed in said cover permitting said lugs to pass therethrough, so that the trap unit is partially inserted in the cover with said lugs passing through said slots of the cover and then is slightly rotated about its axis to connect the trap unit to the cover, and, a support spring arranged between said cover and said thermowax element.

4,441,653
BI-METALLIC VANE VENT DAMPER

George Grudich, Rochester, Mich., assignor to Paragon Resources, Inc., Warren, Mich.

Filed Jun. 11, 1981, Ser. No. 272,444
Int. Cl.³ G05D 23/02
U.S. Cl. 236—93 R 5 Claims



1. A damper for a furnace exhaust gas flue, comprising:

a cylindrical sheet metal housing section adapted to be disposed within the flue so that vented combustion gases from the furnace pass through the housing;

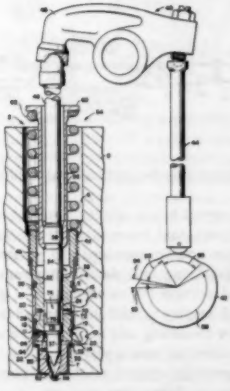
a pair of flat members each having an elongated portion and an ear portion disposed within the housing with the ear portions secured to diametrically opposed points on the interior of the housing so that the longitudinal axis of the flat members extend at right angles to the longitudinal axis of the housing, with the sides of the flat members being parallel to the longitudinal axis of the housing; and

a pair of semi-circular vanes formed of two separate sheets each consisting of two laminated metal layers, one layer having a relatively high coefficient of thermal expansion and the other having a relatively low coefficient of thermal expansion, each vane having a generally flat upper end with flat opposing sides and curved lower edges, means to secure the upper ends of the two vanes to the elongated portion of the flat members, the elongated portions of the two members serving to sandwich the upper ends of the two vanes together in directly abutting relationship, so that the flat side edges of the vanes extend normally to the longitudinal axis of the housing, the two vanes projecting from the flat members in the direction of the furnace free from any structure between the vanes, and being designed so that they curved outwardly, in opposed directions, when disposed at a temperature below the temperature they experience when the furnace is operating to block a major portion of the cross-sectional area of the flue, and bend under the force of their differential expansion when the furnace is operating so that their planes lie substantially parallel to the longitudinal axis of the flue, with the vanes abutting each other substantially throughout their entire lengths thereby allowing substantially unrestricted gas flow through the flue.

4,441,654
FUEL INJECTOR ASSEMBLY INCLUDING A BLOW-BACK PREVENTION CAM

Lester L. Peters, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 31, 1981, Ser. No. 336,334
Int. Cl.³ F02M 47/02
U.S. Cl. 239—89 11 Claims



1. A fuel injector assembly for injecting periodically into a combustion chamber of an internal combustion engine fuel received from a fuel supply flow path, comprising:

(a) an injector body containing

(1) a central bore, and

(2) an open injection orifice located to provide a communication path between the central bore and the combustion chamber;

(b) supply connecting means for providing a pathway for fuel to flow from the supply flow path into the central bore, said supply connecting means containing a supply

passage which communicates with the central bore through a feed orifice;

(c) an injector plunger mounted for reciprocal movement within the central bore between an innermost position in which the injection orifice is closed by the inner end of said injector plunger and an outermost position in which an injection chamber is formed within the central bore between the inner end of said injector plunger and the injection orifice, said injector plunger including a cylindrical surface in direct sealing contact with the interior surface of the central bore to form an injection chamber seal; and

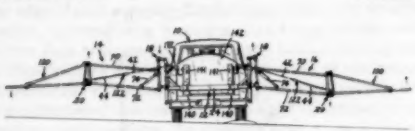
(d) cam actuating means for reciprocating said injector plunger in timed sequence with the movement of a piston within the combustion chamber in a manner to cause fuel to be metered into the injection chamber without blow back of gas into the supply passage by moving said cylindrical surface outwardly beyond the feed orifice to cause the feed orifice to open directly into the injection chamber only when the combustion chamber pressure is relatively low and by terminating fuel metering substantially before fuel injection commences by moving said injector plunger inwardly to a supply passage blocking position in which said cylindrical surface is positioned over the feed orifice to seal the supply passage from the injection chamber during the period that combustion chamber pressure otherwise is increasing sufficiently to cause blow-back of gases into the supply passage if the supply passage were left unblocked.

4,441,655

AGRICULTURAL SPRAYING APPARATUS

Harold Blumhardt, Ashley, N. Dak., assignor to Blumhardt Manufacturing Co., Ashley, N. Dak.

Filed Mar. 6, 1981, Ser. No. 241,415
Int. Cl.³ B05B 1/20
U.S. Cl. 239—163 **14 Claims**



13. Boom apparatus for agricultural applications, comprising:

(a) a cantilevered boom structure suitable for mounting of sprayer heads, said boom structure including an inboard end portion and an outboard end portion, said outboard end portion being articulately interconnected to said inboard end portion for movement in a generally vertical plane with respect to said inboard end portion;

(b) means for mounting said boom structure to a drive vehicle, said mounting means permitting rotation of said boom about a generally vertical axis to permit said boom to yield in response to obstruction contact;

(c) spring-biased centering means, connected to said boom structure to maintain said boom structure oriented generally transverse to said drive vehicle in its normal position, and to recenter said boom structure to said transverse position absent obstructive forces thereon; and

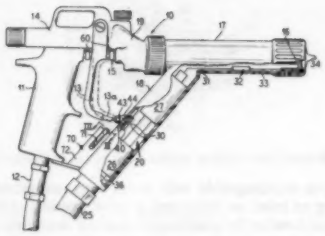
(d) said spring-biased centering means also including means for lifting said outboard end portion of said boom structure independently of said inboard end portion as said boom structure moves away from its normal position to allow said structure to overcome obstacles or lift from ground contact.

4,441,656

ELECTROSTATIC DISABLING SWITCH FOR ELECTROSTATIC SPRAY GUNS

Willi Huber, Heerbrugg, Switzerland, assignor to J. Wagner AG, Switzerland

Filed Jan. 29, 1982, Ser. No. 343,812
Int. Cl.³ B05B 5/02
U.S. Cl. 239—708 **10 Claims**



1. In an electrostatic spray device having an electrode and power supply circuitry for the electrode, a coating supply conduit terminating at an orifice means and a valve controlling flow through the orifice, switch means for activating the power supply, said switch means and valve being activated by movement of a trigger means, the improvement of the switch means being magnetically operated by a magnet means, an activating means on the trigger means for effecting the magnet means to activate the switch means in dependent response to movement of the trigger means and a second magnet means carried by the device movable towards and away from the switch means to override the trigger means activating means to prevent trigger means movement actuation of the switch means.

4,441,657

DECREASING STATIC CHARGE OF A PARTICULATE SOLID PRODUCT WHICH CAUSES PRODUCT TO PLUG METAL LINE USED FOR PNEUMATIC FLUIDIZED SOLID CONVEYANCE

Nicholas C. Huie, Naperville, Ill., and William Bradley, Sullivans Island, S.C., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 16, 1981, Ser. No. 311,931
Int. Cl.³ B02C 19/12
U.S. Cl. 241—14 **4 Claims**

1. A method of decreasing the static charge accumulating tendency of a mass of high purity terephthalic acid having an average particle size of from 185 microns and above which method comprises grinding at least 10 weight percent of the high purity terephthalic acid to sharp, rough particles having a particle size of from about 40 to about 100 microns and blending the ground mass of terephthalic acid with the mass of unground purified terephthalic acid.

4,441,658

SANDMILL SCREEN MOUNTING ASSEMBLY

Edward J. Szkaradek, Santa Ana, Calif., assignor to Morehouse Industries, Inc., Fullerton, Calif.

Filed Nov. 16, 1981, Ser. No. 321,389
Int. Cl.³ B02C 17/18
U.S. Cl. 241—46.17 **11 Claims**

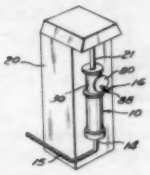
1. An apparatus for grinding or processing a liquid, having a vertical vessel, with a lower cylindrical segment and an upper cylindrical segment, for receiving grinding media and a liquid to be processed, a motor-driven rotor in the vessel for agitating the media, and a liquid inlet at the bottom of the vessel, the improvement comprising:

a single generally T-shaped casting having a large cylindri-

cal segment forming the upper cylindrical segment of the vessel and having a large tubular liquid outlet portion extending radially outward from the upper cylindrical segment, the outlet portion having an enlarged outer cylindrical end forming an inner annular shoulder facing the end of the outlet portion;

a removable filter screen assembly fitting in the tubular outlet portion and having an annular outer rim that abuts said shoulder;

a removable cover abutting the end of the outlet portion and



abutting the outer rim of the filter screen assembly to hold the filter screen assembly in position, the cover having a port providing an outlet for the filtered product; and

a circular retaining ring surrounding the cover and the end of the outlet portion for holding the cover against the end of the outlet portion, said screen assembly including a screen having a cup-shape with an open end positioned adjacent the cover, a cylindrical screen side wall spaced inwardly from the surrounding outlet portion, and a screen end wall positioned within said outlet portion adjacent said vessel upper segment.

4,441,659

ARRANGEMENT IN DRUM MILLS

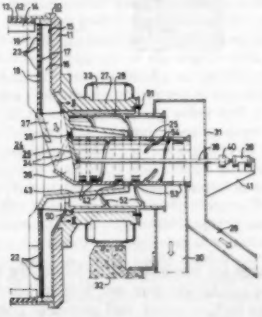
Olle E. Marklund, Risgatan 8, S-930 50 Boliden, Sweden

Filed Nov. 17, 1980, Ser. No. 207,795

Claims priority, application Sweden, Nov. 30, 1979, 7909921

Int. Cl.³ B02C *17/00*

U.S. Cl. 241—70 **9 Claims**



1. A drum mill for autogenous or semi-autogenous wet-grinding processes and being of the type having a screening wall which is arranged adjacent a mill drum end wall provided with a hollow material-discharge trunnion and which separates said end wall from a grinding space within the mill, wherein said screening wall has at least one first group of relatively small grate openings through which fine material ground in the mill constantly leaves the grinding space and departs through the discharge trunnion, and at least one second group of relatively large openings through which mixed material, comprising both fine and coarse material, can leave the grinding space, said second group of openings communicating with an individual material outlet via switching means by which the material mixture passing through said second group of openings can be prevented from leaving the mill, and classifying means for dividing said material mixture upsteam of the outlet therefore into at least one coarse fraction and at least one finer fraction having a maximum particle size which is at least equal to the maximum particle size of said fine material, and wherein means are provided for returning at least a major part of said finer fraction to the grinding space.

4,441,660

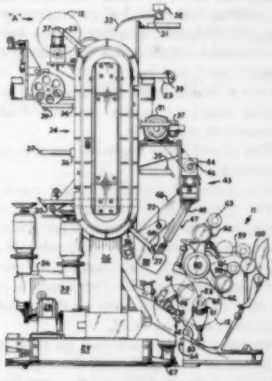
APPARATUS FOR AUTOMATICALLY DOFFING YARN PACKAGES AND DONNING EMPTY BOBBINS ON A WINDER

Nathan Cloud, Wilmington; Robert A. Marin, Newark, and James E. McErlane, Wilmington, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 27, 1982, Ser. No. 382,768

Int. Cl.³ B65H *67/04*

U.S. Cl. 242—35.5 A **2 Claims**



1. In a winding apparatus having a plurality of windups, each windup including a drive roll, a pair of rotatable chucks carrying yarn support bobbins alternately movable from a park position into surface driven engagement with the drive roll then to a rest position, and a pair of articulated swing arms for moving the bobbins through said positions, an apparatus for doffing yarn packages from the chucks and donning empty bobbins on the chucks, said apparatus comprising:

(a) a frame mounted for movement into a position adjacent each windup;

(b) a gripper to engage said swing arms when in the rest position;

(c) means connecting the gripper and the frame for moving the gripper into engagement with said arms and moving the gripper and swing arms from the rest position first to a doff-don position then to said park position;

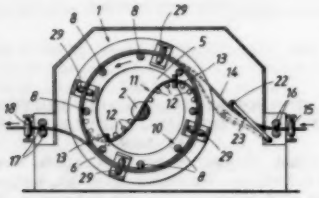
(d) means attached to said frame at a location adjacent said doff-don position for doffing yarn packages from the chuck and donning empty bobbins thereon following doffing when the swing arms are in the doff-don position; and

(e) endless conveyor means attached to said frame for delivering doffed yarn packages from said doff-don position to a location away from said winder and for delivering empty bobbins to said doff-don position for placement on said chucks by said means for donning bobbins.

4,441,661
APPARATUS FOR STORING STRIP, PARTICULARLY METAL STRIP

Karl Steinmair, Schildberg, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 12, 1982, Ser. No. 397,585
Claims priority, application Austria, Sep. 30, 1981, 4181/81
Int. Cl.³ B65H *17/48*
U.S. Cl. 242—55 **5 Claims**



1. In apparatus for storing strip, comprising a frame and two roller cages having a common horizontal axis and mounted on said frame and rotatable about said common axis, each of said roller cages comprising a circular series of angularly spaced apart, rotatably and radially adjustably mounted rollers parallel to said common axis,

the improvement residing in that

said frame is mounted for rotating about said common axis,

said roller cages are axially juxtaposed and non-rotatably connected to said frame,

the rollers of said roller cages are equal in number and angular spacing,

a circular series of swiveling shafts equal in number and angular spacing to the rollers of each of said axes and parallel to those of said rollers are rotatably mounted in said frame and extend through both said roller cages,

each of said swiveling shafts carries two pairs of radial arms,

each of said rollers of said roller cages is carried by one of said pairs of radial arms and eccentric with respect to the associated swiveling shaft,

said two pairs of arms mounted on each of said swiveling shafts are so arranged that the rollers carried by said swiveling shafts are disposed on opposite sides of an axial plane which extends through said common axis and the axis of said swiveling shaft, and

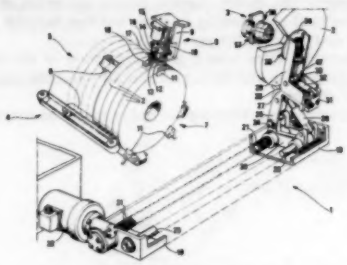
a strip guide is carried by and non-rotatably connected to said frame and extends inside said roller cages along an S-shaped path from a point near the periphery of one of said roller cages to a point near the periphery of the other of said roller cages.

4,441,662
REELS SUPPLYING DEVICE

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa' per Azioni, Bologna, Italy

Filed Feb. 2, 1982, Ser. No. 345,039
Claims priority, application Italy, Feb. 25, 1981, 3344 A/81
Int. Cl.³ B65H *19/08, 17/02*
U.S. Cl. 242—58 **6 Claims**

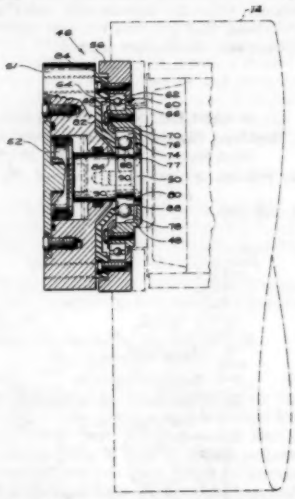
1. A device for automatically supplying reels (2) to a user machine (3), the device comprising a magazine (4) for a plurality of reserve reels (2) each provided with an internal tubular support tube (39), an unwinding spindle (57) arranged on said machine (3), a support member (20, 30) for one of said reels (2), and first releasable locking means (71) carried by said spindle (57) and adapted to be operated by the support member (20, 30) for locking said one reel (2) on the spindle (57), said suppor member (20, 30) being mounted for movement between a take-up position (7) in front of said magazine (4) and a release position (56) in front of said spindle (57) and comprising second releasable locking means (51) adapted to engage an inner surface of the hub (39) of said one reel (2) to lock the same relative to said support member (20, 30), and actuator means (47) associated with said second locking means (51) to move the same radially of said hub (39) to a locking position.



4,441,663
WEB CINCHING AND WINDING APPARATUS

Richard D. Welch, Pittsford, N.Y., and John G. Mulder, Kingston, Jamaica, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,320
Int. Cl.³ B65H *17/02, 17/08;* **F16H** *13/08*
U.S. Cl. 242—65 **7 Claims**



1. An apparatus for automatically cinching the end portion of a web onto a cylindrical core and winding convolutions of web on the core to form a roll, said apparatus comprising:

a roller having a roll drive surface spaced from the outer surface of the core;

means for transporting a web between said roll drive surface and outer core surface;

means for guiding the end portion of the tranported web around the outer surface of the core and into a nip formed by the web and outer core surface;

a rotatably mounted gudgeon adapted to drivingly engage the core for rotating the core;

a rotatably mounted drive wheel normally rotatably driven by said roll drive surface; and

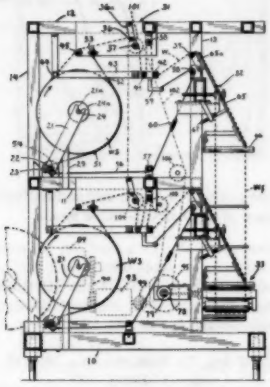
means directly coupling said drive wheel to said gudgeon whereby said gudgeon rotates the core at an outer core surface speed greater than said web spread for cinching the end portion of the web onto the core.

4,441,664

APPARATUS FOR FEEDING WEB MATERIAL FROM A SUPPLY ROLL

Roger H. Stohlquist, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed Jul. 26, 1982, Ser. No. 402,137
Int. Cl.³ B65H 17/22, 23/08, 23/16, 25/04
U.S. Cl. 242—75.42 4 Claims



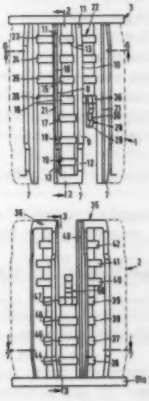
1. An apparatus for feeding a web of material from a supply roll to web processing euipment of the type that exerts an intermittent pulling force on the web during intermittent advance through the processing equipment, the apparatus including, a support frame means for supporting a supply roll of web material on the frame for unwinding rotation, web loop forming means including loop guide means mounted at a stationary location on the frame and dance means mounted on the frame for movement toward and away from the loop guide means and adapted to form a variable size loop in the web passing between the dancer means and the loop guide means, a flexible brake band means, means anchoring one end of the brake band means on the frame and means guiding the other end of the brake band means to cause the brake band means to extend part way around the periphery of the supply roll, brake applying means including a longitudinally extensible and contractable spring means operatively connected at one end to said dancer means and at its other end to the other end of the brake band means and constructed and arranged to draw the brake band means against the periphery of the supply roll when the dancer means moves to a position away from the loop guide means, the dancer means being yieldably biased in a direction away from the loop guide means to apply tension through the longitudinally extensible and contractable spring means to the brake band means, the dancer means being constructed and arranged to move toward the loop guide means and reduce tension applied to the brake band means when the web is drawn from the loop forming means at a rate faster than the web unwinds from the supply roll, outlet web feed roller means engageable with the web after it exits from the web loop forming means and operative when a pull is exerted on the web exiting from the web feed roller means to draw the web from the web loop forming means, web folding means engaging the web at a location between the web loop forming means and the outlet web feed roller means for longitudinally folding the web to form a longitudinally folded web that exits from the web folding means along a linear path of travel, said outlet web feed roller means including first and second relatively parallel feed rollers and an exiting web guide roller, means mounting the first web feed roller on the frame for axial rotation at one side of said linear path of travel of the folded web exiting from the web folding means, lever means mounted on frame for pivotal movement about an axis at the other side of said linear path of travel of the folded web, means mounting the second web feed roller at the other side of said linear path on one end of the lever means for movement along a path generally perpendicular to said linear path of travel of the folded web toward and away from the first web feed roller, means mounting the exiting web guide roller on the other end of said lever means with its periphery generally tangent to a plane extending between the first and second web feed rollers and in the direction of said linear path of travel to engage the folded web exiting from the first and second feed rollers and maintain the folded web substantially in said linear path of travel as it exits between the first and second feed rollers, means including intermeshing gear means on the first and second feed rollers for driving the first and second feed rollers at the same speed and in directions to advance the folded web, and exiting web guide means engageable with the folded web after it exits from the exiting web guide roller for guiding the folded web in an exiting direction having a substantial component laterally of said other side of said linear path of travel to shift the second feed roller toward the first feed roller in response to tension on the folded web exiting from the exiting web guide roller.

4,441,665

AXIALLY TELESCOPIC COIL CARRIER

Gerhard H. Hahm, Aachen, Fed. Rep. of Germany, assignor to Jos. Zimmerman, Aachen, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,326
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 8110872[U]
Int. Cl.³ B65H 49/00, 75/20
U.S. Cl. 242—129 15 Claims



1. An axially telescopic coil carrier for receiving a coil or spool of thread or yarn, said coil carrier having a number of coil parts which are telescopically displaceable on with respect to the other, and ones of said coil carrier parts having a respective end ring element and a plurality of carrier elements extending longitudinally of the respective coil carrier part from said end ring element to form susbtantially cylindrical surfaces, the improvement comprising:

first and second reinforced section means placed, respectively, adjacent to the end ring members of said end coil carrier parts for connecting adjacent carrier elements to each other to form circumferential supporting elements, respective free ends of said carrier elements extending axially therefrom to the zone of the opposed one of said end ring elements,

means forming radial support means for free ends of the respective carrier elements, said being respectively shaped such that the side basis of the carrier elements of each said coil carrier part abut opposed side faces of carrier ele-

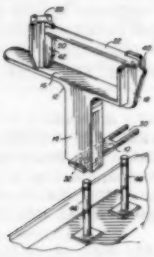
ments of the opposed coiled carrier part so that at least each second one of the circumferentially juxtaposed carrier elements of the two coil carrier parts are provided with radial apertures.

4,441,666

SEWING MACHINE ADAPTER

Ronald H. Tower, and Elizabeth S. Tower, both of 866 W. Isabella, Mesa, Ariz. 85202

Filed Jun. 16, 1982, Ser. No. 388,889
Int. Cl.³ B65H *49/18*
U.S. Cl. 242—134 **8 Claims**



1. An adapter for use on a sewing machine equipped with first and second spool pins, said adapter for enabling said machine to operate with non-conventional spools of thread such as plastic or cardboard tube spools, small conical base spools and large spools having a large bore therethrough, comprising:

first means for mounting said adapter on said spool pins;

yoke means rotatably coupled to said first means;

a first vertical mounting fin fixedly coupled to said yoke means;

a second vertical mounting fin fixedly coupled to said yoke means;

a mounting rod hingedly coupled to said first mounting fin and capable of assuming stable horizontal and vertical positions;

a compression finger hingedly coupled to the vertical yoke; and

a stabilizing bar frictionally attached to the vertical yoke with discrete rotational intervals.

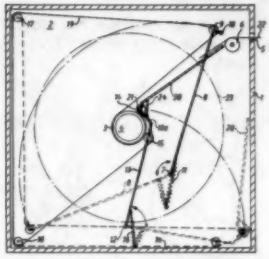
4,441,667

CASSETTE FOR WINDING BAND-LIKE PHOTOGRAPHIC MATERIAL

Siegfried Bartel, Gauting; Wolfgang Ermer, and Bernd Payrhammer, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Dec. 10, 1981, Ser. No. 329,564
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048727
Int. Cl.³ G03B *1/04, 23/02;* G11B *15/04*
U.S. Cl. 242—197 **10 Claims**

1. A cassette for winding a band-like photographic material to form a spool, comprising a housing having a slot for introducing a material; a driven winding core having an axis; an endless band; a spring element; two lever arms pivotable about pivot axes which are parallel to said winding axis, carrying at their ends guiding rollers and coupled with one another via said endless band, one of said lever arms being connected with said spring element so that said lever arms in an initial condition assume a first position in which said endless band widely embraces said winding spool, and during further winding upon overcoming a dead point of said spring element said lever arms



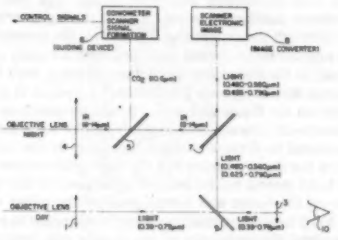
assume a second position in which said endless band is brought out of the region of a greatest possible spool.

4,441,668

INFRARED-OPTICAL AIMING AND GUIDING DEVICE

Josef F. Menke, Glücksburg, Fed. Rep. of Germany, assignor to Elektro-Optik GmbH & Co. KG, Glucksburg, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 145,472
Int. Cl.³ F41G *7/30*
U.S. Cl. 244—3.11 **3 Claims**



1. An aiming and guiding device for tracer missiles emitting infrared beams of a narrow spectral band, the device comprising

a. a daylight aiming device including a first objective lens and an ocular;

b. a night aiming device including a second objective lens and a converter for transforming infrared-beam images into visible-light images; the axes of the first objective lens and the second objective lens extending in parallel;

c. a missile guiding device including a goniometer for measuring the difference between the missile path and the line of sight of the aiming device and for issuing control signals for guiding the missile on the line of sight of the aiming device; the night aiming device and the goniometer both utilizing infrared beams of the same spectral region which also includes the narrow spectral band of the beams emitted by the missile;

d. first partially transmitting mirror means arranged along the optical axis of the second objective lens for reflecting the narrow band of infrared beams emitted by the missile to the goniometer and for transmitting all remaining infrared beams of the spectral region to the infrared/visible-light image converter; and

e. second partially transmitting mirror means in the optical path of the first objective for reflecting part of the visible light beams emitted by the converter into the ocular of the daylight aiming device.

4,441,669

APPARATUS FOR THE PRODUCTION OF A GUIDE PATTERN OF LIGHT BEAMS

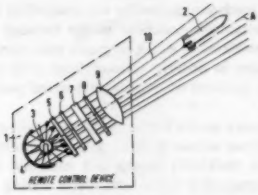
Harald Wich, Schwaig, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,845

Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117685

Int. Cl.³ F41G 7/26

U.S. Cl. 244—3.13 5 Claims



1. Apparatus for producing a guide beam pattern for a missile, wherein the guide beam pattern comprises a plurality of bundles of light beams collectively surrounding an axis of the beam pattern, said bundles of light beams being modulated in individually different manners by means of electric modulating potentials from optical modulators, the improvement wherein said modulators comprise PLZT ceramic segments each of which forming a bundle of light beams, said segments collectively covering the entire cross-section of the beam pattern of a single source of light, and means for applying different modulating potentials to said segments.

4,441,670

GUIDED PROJECTILE

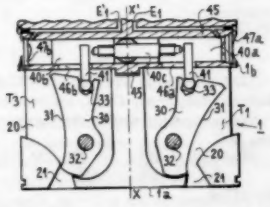
Roger Crepin, Paris, France, assignor to Brandt Armements, Paris, France

Filed Apr. 20, 1982, Ser. No. 370,255

Claims priority, application France, Apr. 21, 1981, 81 07916

Int. Cl.³ F41G 7/00

U.S. Cl. 244—3.22 4 Claims



1. A guided projectile comprising more especially a source of energy supplying a gas flow and two pairs of mutually orthogonal lateral nozzles, each of these nozzles being provided with a valve for regulating the gas throughflow, wherein each valve comprises essentially a pivoting vane one of whose faces forms a wall of the nozzle and the vanes corresponding to each pair of nozzles are interlocked and positioned by means of two parallelogram mechanisms whose transverse elements are the drive elements.

4,441,671

TAKE-OFF RAMPS FOR AIRCRAFT

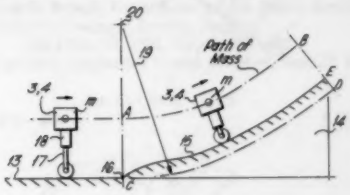
Douglas C. Thorby, Shepperton, and Michael C. W. Sullivan, Sutton, both of England, assignors to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 188,667, Sep. 19, 1980, abandoned. This application Nov. 17, 1982, Ser. No. 442,298

Claims priority, application United Kingdom, Sep. 29, 1979, 7933885

Int. Cl.³ B64F 1/04

U.S. Cl. 244—63 1 Claim



1. A take-off ramp for an aircraft having compressible landing gear, said take-off ramp being adapted to be associated with a generally horizontal take-off surface, said ramp having an upper surface profile defined by the superimposition of two coterminous profiles, the first of which being a generally circular arc having an origin positioned such that the arc has a point of tangency with said horizontal take-off surface, the second profile comprising a cam-like surface, the thickness of which increases along its length but the rate of increase of thickness decreasing therealong, the first profile causing a generally constant radial load to be transmitted to the aircraft via said compressible landing gear as it traverses the ramp, the second profile being arranged to compensate for contraction of the landing gear caused by the transmission of said radial load, whereby as the aircraft traverses the ramp it closely follows a generally circular path having an origin substantially coincident with the origin of said first profile, irrespective of the contraction of the landing gear.

4,441,672

RETRACTILE SUPPORT UNIT FOR AN ARRESTING CABLE DISPOSED ACROSS A TAKE-OFF OR LANDING STRIP FOR AIRCRAFT

Gilbert R. Aglae, Orsay; Jacques J. Alavoine, Neauphle le Chateau; Claude Contensou, Paris; Jacques R. Rousseau, Epinay sur Orge, and Celestin Cerati, Longjumeau, all of France, assignors to Aerazur EFA, France

Continuation-in-part of Ser. No. 176,430, Aug. 8, 1980, abandoned. This application Aug. 20, 1982, Ser. No. 410,097

Claims priority, application France, Aug. 10, 1979, 79 20491

Int. Cl.³ B64F 1/02

U.S. Cl. 244—110 C 4 Claims

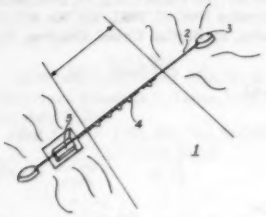
1. A retractile support unit for an arresting cable disposed across a take-off or landing strip for aircraft, comprising:

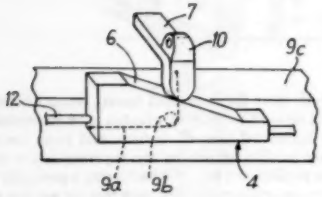
(i) a plurality of actuators supporting said arresting cable and disposed in a channel across the strip, each actuator including a cam having an inclined plane and adapted to move in said channel parallel to the arresting cable, a cable support engaging said inclined plane and adapted to pivot about an axis parallel to the arresting cable, and a mechanical connection maintaining said cable support permanently in engagement with said inclined plane,

(ii) a motor unit disposed at one side of the strip,

(iii) a member connecting the cams of the actuators, said connecting member passing about a pair of pulleys and being connected to said motor unit for movement parallel to the arresting cable so as to exert a pulling action on the cam when the connection member is moved in each direction,

movement of the connecting member in one direction causing said cable supports to be raised and pivoted such that the arresting cable emerges from the channel and is moved away





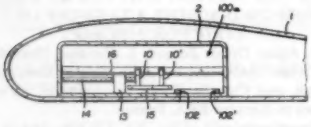
from being vertically above the channel, and movement of the connecting member in the other direction causing the arresting cable to be retracted into the channel.

4,441,673

AIRFOIL FUEL EJECTION DEVICE

Ralph P. Muscatell, 2007 NE. 20th Ave., Fort Lauderdale, Fla. 33305

Filed Aug. 19, 1981, Ser. No. 294,377
Int. Cl.³ B64D *37/26*
U.S. Cl. 244—135 R **2 Claims**



1. An airfoil fuel ejection device integrated into an under-side of an airfoil in order to facilitate the immediate release of fuel or other fluid contents present in a fuel storage compartment means in said airfoil through a remote control mechanism, said device comprising in combination:

a retractable bulkhead means for forming a bottom closure of said fuel storage compartment means maintaining a normal flight operation position in which it forms an integral component of said under-side of said airfoil and isolates said fuel storage compartment means from the atmosphere, said retractable bulkhead means in said normal flight operation position thereof extending across most of the extent of said fuel storage compartment means laterally of the air-foil;

a worm gear control means for maintaining said retractable bulkhead means in said under-side of said airfoil and for displacing said retractable bulkhead means from said normal flight operation position thereof to an open position in which it is offset from the remainder of the under-side of the airfoil and opens said fuel storage compartment means to the atmosphere for rapid and controlled dumping of the fuel;

a drive-motor means operatively coupled to said retractable bulkhead means through said worm gear control means for displacing said retractable bulkhead means from said normal flight operation position through prescribed displaced positions to a fully retracted position in response to the operation of said worm gear control means and drive motor means as dictated by said remote control mechanism;

a rigid rod guidance means for the controlled displacement of said retractable bulkhead means through various prescribed positions in order to guide said retractable bulkhead means in orderly fashion from said normal flight operation position to the fully retracted position and return; and

a gasket closure means for securing and sealing said retractable bulkhead means in order to provide restraint on said retractable bulkhead means and maintain the latter in sealed engagement with said airfoil during said normal flight operation position and prevent inadvertent leakage or dumping;

said retractable bulkhead means comprising a unitary door member slidably mounted reciprocably from forward to rear on said under-side of said airfoil through prescribed locations between said normal flight operation position and where said fuel compartment is fully exposed;

said rigid rod guidance means comprising a track means extending substantially parallel to said under-side of said airfoil from forward to rear above said unitary door member;

said rigid rod guidance means further comprising cylinders and pistons operatively coupled to said track means for directing and controlling said unitary door member through multiple locations between said normal flight operation position and where said fuel compartment means is fully exposed;

said worm gear means comprising a rotatable worm gear driving shaft operated by said drive motor means under the control of said remote control mechanism, said worm gear driving shaft being operatively coupled to said cylinders and pistons to guide said unitary door member internally through multiple locations between said normal flight operation position and where said fuel compartment is fully exposed; and

said gasket closure means comprising gasket means affixed on said under-side of said airfoil for sealed engagement by said unitary door member in said normal flight operation position in order to provide structural integrity and achieve maximum closure for said fuel storage compartment means.

4,441,674

CONSTRAINED STORE EJECTOR

John W. Holtrop, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1981, Ser. No. 231,718
Int. Cl.³ B64D *1/02, 1/12*
U.S. Cl. 244—137 R **5 Claims**

1. A suspension and release mechanism for stores on a launch vehicle, such as an aircraft, comprising:

at least one ejector module fastened to said launch vehicle which comprises:

an ejector body fastened to said launch vehicle;

an ejector piston set within said ejector body for moving said store from a release load position to a carriage/hold position and back again by hydraulic pressure;

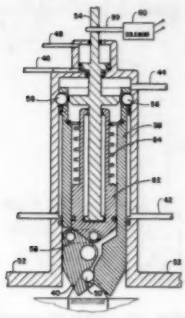
a latch hook pivotally mounted to the end of said ejector piston for grasping said store;

a release piston mounted within said ejector piston and mechanically connected to said latch hook for pivoting

said latch hook between said carriage and release positions;

a release rod mounted within said release piston for changing the position of said latch hook via said release piston; and

a spring around said release piston for limiting release of said store to upward motion of said release rod forcing compression of said spring;



means for connecting said ejector module to a hydraulic system, such that said ejector module functions by applied pressure to hydraulic fluid; and

a hydraulic sway brace system attached to said ejector module for rigidly supporting said store along said launch vehicle prior to launch of said store.

4,441,675

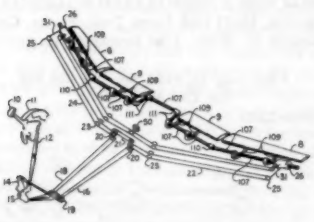
HIGH LIFT SURFACE ACTUATION SYSTEM

Wilfred E. Boehringer, Fullerton, and Teunes Verhoeven, Long Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 25, 1982, Ser. No. 392,356

Int. Cl.³ B64C *3/50*; F16H *1/44*; G05D *1/00*

U.S. Cl. 244—213 **12 Claims**



9. A drive system for a high-lift device on an aircraft consisting of at least two independent segments comprising:

first and second motors having first and second brakes releasable with the application of power;

a first differential gear box which sums both the force and speed of two inputs connected to the output of said first and second motors having first and second brakes to form a first drive unit;

third and fourth motors having third and fourth brakes releasable with the application of power;

a second differential gear box which sums both force and speed of two inputs located remote from said first differential gearbox and connected to the output of said third and fourth motors having third and fourth brakes to form a second drive unit;

a torque tube connected between the outputs of said first and second drive units so as to form an open loop drive, driven from each end;

means connected between said torque tube and said high-lift device segments for extending and retracting said high-lift device segments as a result of rotation of said torque tube;

at least one power source connected to said first and second drive units; and

means to control said power source.

4,441,676

FORCE CONTROL MEMBER ASSEMBLIES

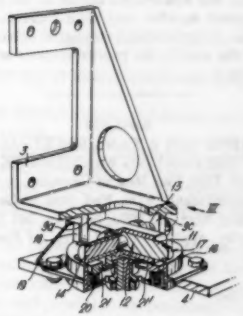
Ralph Rowarth, Brough, England, assignor to British Aerospace Public Limited Company, London, England

Filed Sep. 14, 1981, Ser. No. 302,086

Claims priority, application United Kingdom, Sep. 27, 1980, 8031297

Int. Cl.³ B64C *13/46*

U.S. Cl. 244—234 **8 Claims**



1. A mounting assembly for a force control member unit of the type described, said mounting assembly being adapted to allow significant sensible displacement of said force control member unit on application of a control force and comprising:

(1) bracket means for being attached to the body of said force control member unit,

(2) a fixed member for rigid attachment to a structure,

(3) pivot means pivotally coupling said bracket means to said fixed member for pivotal movement with respect thereto about a median position, and

(4) restraining means adapted resiliently to restrain pivotal movement of said bracket means and comprising an element of resiliently deformable material disposed with respect to the fixed member and the bracket means so that on displacement of the bracket means from its median position a portion of said element is compressed thereby to provide a restoring force.

4,441,677

CLAMP DEVICE

Robert M. Byerly, Burbank, Calif., assignor to TA Mfg., Inc., Glendale, Calif.

Filed Apr. 2, 1982, Ser. No. 365,104

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—74.3 **20 Claims**

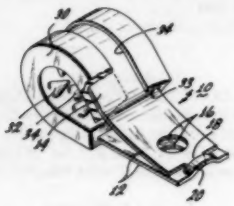
7. A resilient lining for use with a clamp device having clamp means formed by an elongated member and including at least a loop portion, including

a resilient lining formed by a strip of resilient material of a sufficient length to extend along the elongated member in the loop portion and of a sufficient width to extend across the elongated member in the loop portion,

the strip of resilient material including means formed on one side of the strip for attaching the strip to the loop portion of the elongated member to have the strip form a resilient

lining on the inside of the loop portion of the elongated member, and

the strip of resilient material including gripping means formed on the other side of the strip and with the gripping means formed as a plurality of needle-like protruberences



extending from the other side of the strip along the length of the strip and toward the center of the loop portion of the elongated member and with individual ones of the needle-like protruberences staggered relative to adjacent others of the needle-like protruberences across the width of the strip.

4,441,678

MOUNTING FOR A TANK RECEPTACLE IN A SUPPORTING FRAMEWORK

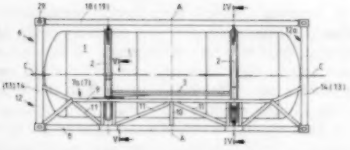
Willi Dorpmund, Elze, Fed. Rep. of Germany, assignor to Graaff Kommanditgesellschaft, Elze, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,328

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012938

Int. Cl.³ A47G *25/00*

U.S. Cl. 248—146 **10 Claims**



1. A supporting arrangement for a substantially torsionally rigid tank receptacle, the supporting arrangement comprising:

a latticed cage-like framework adapted to accommodate a tank, the framework being torsionally flexible and stackable with similar frameworks, and

a plurality of support means for mounting a tank within the framework, one of the support means being spaced from the others in the longitudinal direction of the tank, said one support means including two support members for pivotally joining the tank to the framework, and means for interconnecting the two support members,

whereby torsional flexing of the framework is not transmitted to the tank.

4,441,679

POST ASSEMBLY

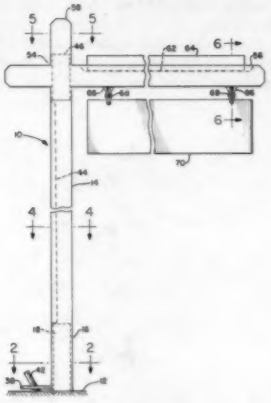
Rudolph J. Calet, 1179 Berwin Ave., Akron, Ohio 44310

Filed Mar. 8, 1982, Ser. No. 356,091

Int. Cl.³ A45F *3/44*

U.S. Cl. 248—156 **8 Claims**

1. A portable post assembly for mounting vertically on an earthen surface comprising a post member having a hollow end with a generally square cross section, a base member slidably positioned in said hollow end, said base member having at least two openings positioned in diagonally opposite corners of said hollow end and elongated removable base supporting members removably disposed in said openings for movement through said openings and extending beyond said post member for penetration into the earthen surface and at least one removable



post securing member removably engageable with said post member for preventing movement of said base member out of said hollow end.

4,441,680

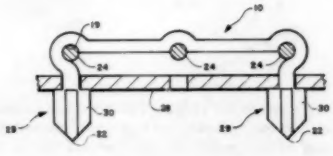
ANCHOR FOR A PERFORATED BOARD HANGER

Bernard Rivkin, 16287 Oak Creek Trail, Poway, Calif. 92064, and Marshall W. Wolfe, 2744 Brookside St., Ontario, Calif. 91761

Filed Aug. 16, 1982, Ser. No. 408,153

Int. Cl.³ A47B *96/06*

U.S. Cl. 248—220.4 **7 Claims**



1. An anchor for stabilizing and securing perforated board hangers in apertures in a board having a plurality of apertures therethrough positioned in a spaced apart relationship, said perforated hangers include an upright shank with at least one integral offset hook for insertion through at least one of said plurality of apertures for securing thereto, comprising an elongated stabilizing member spanning across the surface remote from said perforated board and formed to at least partially surround the shank of at least one hanger, whereby the shank of said hanger is held in place vertically adjacent to the surface of said board.

4,441,681

MOUNTING APPARATUS FOR OUTSIDE REAR VIEW MIRROR ASSEMBLY

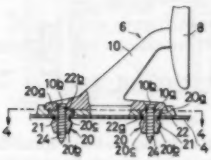
Takaaki Oda, and Hidehiro Otsuka, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 20, 1978, Ser. No. 953,176

Claims priority, application Japan, Dec. 23, 1977, 52-174849[U]

Int. Cl.³ A47G *1/16*; B60R *1/06*

U.S. Cl. 248—475.1 **1 Claim**



1. In a vehicle having an exterior body panel formed with a pair of apertures and an outside rear view mirror assembly having a mirror supporting arm formed with a pair of screw accommodation openings which are capable of being coaxially aligned with the apertures in the exterior body panel, respectively, an apparatus for mounting the outside rear view mirror assembly on the exterior body panel, comprising:

a base pad having a lower surface where it is mounted on the exterior body panel and an upper surface where it carries thereon the mirror supporting arm in such a manner that the apertures in the exterior body panel are coaxially aligned with the openings in the mirror supporting arm, respectively, said base pad being formed with a pair of non-circular holes which are coaxially aligned with the apertures in the exterior body panel, respectively;

two elastic grommets respectively inserted into the apertures in the exterior body panel and temporarily mounted therein with the elastic deformability of the grommets, each of the grommets having a leg section disposed on the inside of the exterior body panel, a non-circular head section received within one of the holes in the base pad in such a manner as to be prevented from rotation about the axis thereof relative to the base pad, and a neck section extending, through one of the apertures in the exterior body panel, between the head section and the leg section;

two self-tapping screws in engagement with the mirror supporting arm, extending through the openings of the mirror supporting arm and screwed into the grommets such that the grommets are reduced in elastic deformability and thereby permanently mounted in the exterior body panel and that the mirror supporting arm is drawn against the grommets thereby to be fixedly held against the exterior body panel by way of the base pad; and

in which said base pad further comprises a pair of tongue sections at the respective axial end of its holes immediately adjacent the lower surface thereof, each of said tongue sections having an opening which is so formed as to accommodate a part of the neck section of each of the grommets and to provide a shoulder upon which the head section of each of the grommets rests such that the base pad and the exterior body panel are temporarily fastened together by being clamped between the head section and the leg section of each of the grommets prior to the fitting of the self-tapping screws into the respective grommets.

4,441,682

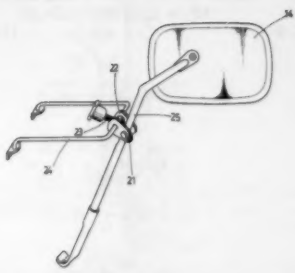
REAR VIEW MIRROR LOCKING MECHANISM

Fu-Chu Su, No. 2-39 Yeng Hang Tsun, Yang Kang Hsiang, Tainan, Taiwan

Filed Jul. 27, 1981, Ser. No. 287,232

Int. Cl.³ A47G *1/24*

U.S. Cl. 248—475.1 **1 Claim**



1. A rear-view-mirror locking mechanism for a car comprising:

a longitudinal arm having one end curved and the other end holding a mirror;

a U-shaped supporting bar defined by a pair of elongate sections joined by a middle portion, each of said elongate sections having a curved end for being removably attached to the fender of a car and a threaded opening in said middle portion;

a pair of parallel plates each of which has one end pivoted to said longitudinal arm and the other end having aperture means therein receiving said middle portion of said supporting bar, said parallel plates positioned on either side of said threaded opening; and

a locking screw threadedly connected through said threaded opening and disposed between said two parallel plates with the screw end abutting against the surface of said longitudinal arm whereby this locking mechanism can be placed at any desired position along the front fender of the car and the curved ends of said longitudinal arm and said U-shaped supporting bar will be firmly secured against the fender edge of the car by turning said locking screw to abut tightly against the surface of said longitudinal arm.

4,441,683

MUSICAL INSTRUMENT HOLDER FOR ATTACHMENT TO VERTICAL AND HORIZONTAL SURFACES

Richard G. Mayne, 1701 W. Pecos Ave., Mesa, Ariz. 85202

Filed May 17, 1982, Ser. No. 379,176

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—558 **3 Claims**

1. An apparatus for holding a musical instrument comprising:

a narrow, elongated, flat, weight-bearing member for attachment to a supporting surface,

a similarly-shaped narrow, elongated, flat, instrument-holding means coupled at one end to one end of said weight-bearing member and extending angularly therefrom,

a first means mounted at the other end of the instrument-holding means for supporting the instrument in one of two positions,

said first means comprises a flat, elongated member extending laterally across said instrument-holding means at a point spaced from said other end,

clamping means attached to the other end of said weight-bearing member for detachably securing said weight-bearing member to a horizontal surface,

an elongated engagement member for mounting on a vertical surface,

said engagement member comprising a portion angularly positioned to the remainder of said engagement member for engaging with said weight-bearing member to prop-

erly support a musical instrument supported by said instrument-holding means,

eyelet means spacedly formed in said weight-bearing member,

means means mounted on said portion for detachably con-

necting with said eyelet means for holding said apparatus on said engagement member, and

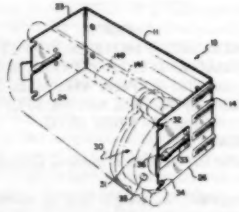
an instrument support means coupled to one end of said engagement member near said instrument support means for engagement at the other end with the instrument for holding it on said engagement member.

4,441,684

PUMP MOUNTING BRACKET

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Nov. 25, 1981, Ser. No. 324,682
Int. Cl.³ F16M 1/00
U.S. Cl. 248—674 30 Claims



1. A mounting bracket for a device, said bracket comprising:

a base;

a pair of substantially parallel, substantially rigid flanges extending from said base;

each said flange comprising at least a first edge;

a first groove in each of said respective first edges of said flanges for receiving at least one engaging element of a device;

retaining means adjacent said first groove on each of said flanges for retaining a corresponding one of said engaging elements within said first groove;

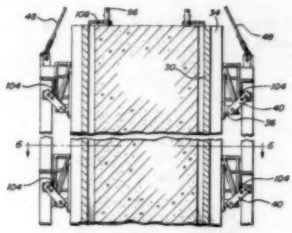
at least one additional groove in each of said first edges for receiving at least one additional retaining element of the device.

4,441,685

COLUMN FORM

Logan C. Greeson, 1286 Marine Dr., West Palm Beach, Fla. 33409

Filed Oct. 14, 1982, Ser. No. 434,190
Int. Cl.³ B29C 1/16
U.S. Cl. 249—51 14 Claims



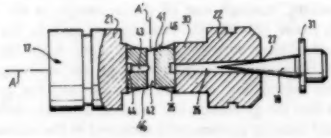
1. A column form including an outer upstanding peripheral frame having a plurality of peripherally extending outer sides, an inner frame having an equal number of inner sides spaced inward from corresponding outer sides of said outer frame, upper and lower parallelogram links pivotally connected at opposite ends to each pair of corresponding outer and inner sides, means for lifting the outer frame, upper and lower pairs of coacting inner and outer wedge means carried by each pair of corresponding inner and outer sides engageable with each other upon downward displacement of said outer frame relative to said inner frame to limit such downward displacement to a lower position of said outer frame with said links substantially horizontally disposed and also engageable with each other upon upward displacement of said outer frame relative to said inner frame to limit such upward displacement to an upper limit position of the outer frame with said links upwardly and outwardly inclined.

4,441,686

ELECTROHYDRAULIC PRESSURE-REGULATING VALVE

Siegfried Seyffer, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 17, 1981, Ser. No. 303,015
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047110
Int. Cl.³ F16K 47/08
U.S. Cl. 251—127 7 Claims



1. An electrohydraulic pressure-regulating valve comprising:

a valve housing formed with a chamber and with an intake passage and an outlet passage opening at spaced-apart locations into said chamber;

a valve member in said chamber between said locations and formed with a longitudinal bore and communicating therewith with a transverse bore through which fluid can flow between said locations, said bores being centered on respective longitudinal and transverse axes and said longitudinal bore forming adjacent said outlet passage a valve seat;

a valve body in said chamber engageable with said valve seat to block flow through said bores;

means for urging said body against said seat; and

a laminar flow throttle in said transverse bore between said seat and said intake passage and formed externally as a body of revolution centered on said transverse axis, said throttle being formed with

an axially throughgoing passage parallel to said transverse axis,

a transverse passage transverse to the axial passage and opening thereinto, and

a circumferential outwardly open groove communicating with said longitudinal bore and transverse passage.

4,441,687

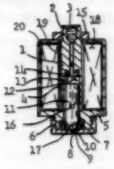
O-RING SOLENOID VALVE

Richard S. Paulukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Division of Ser. No. 972,287, Dec. 22, 1978. This application May 15, 1981, Ser. No. 264,058

Int. Cl.³ F16K *31/06*

U.S. Cl. 251—139 **3 Claims**



1. A solenoid operated valve comprising:

a valve, housing a coaxial solenoid coil peripherally, includes a conventional guide tube assembly comprising an iron at the top thereof with a central flow opening passing therethrough, secured therein permanently to a short non-magnetic thin tube section which terminates at the bottom end thereof with a permanently secured enlarged boss provided with a counterbore which houses O-ring seal while leading to a bottom open end of said guide tube assembly which is closed by an end cup having a central fluid port provided therein, including a central passage in said guide tube assembly for fluid flow therethrough between a first top end of said valve provided with said iron and adaptable of serving as a fluid supply port means and a second bottom end wherein said end cup serves as an exhaust port means, and said O-ring seal serving as a valving means thereof, a ferritic solenoid plunger of an elongated configuration spaced inside said guide tube assembly so as to be movable between said top iron and said bottom O-ring axially and positioned so as to have a first top plunger end face said first top end of said valve while an opposite second end thereof being contoured maintains valve in a first normally closed position preventing fluid flow therethrough by said second plunger end which is seated against said O-ring for peripheral plunger sealing on seal portion exposed thereto when said plunger is forced by the prevailing fluid drag forces to assume said first valve normally closed position until said solenoid coil becomes energized electrically, an when said solenoid coil is energized, a strong magnetic pull force generated therein lifts said plunger from said O-ring seal upwards against said iron to permit fluid flow between said fluid supply and exhaust port means comprising a second valve open position for as long as said solenoid coil is energized electrically, while when said solenoid coil is de-energized electrically, said magnetic force disappears permitting an automatic plunger return by said fluid drag forces to said first valve normally closed position, and vice versa.

4,441,688

BONNETLESS COMPACT DESIGN GATE VALVE

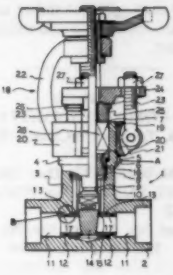
Tomozo Kato, 32-6, Edogawa 6-Chome, Edogawa-Ku, Tokyo, 183, Japan

PCT No. PCT/JP81/00131, 371 Date Dec. 10, 1981, 102(e) Date Dec. 10, 1981, PCT Pub. No. WO82/04300, PCT Pub. Date Dec. 9, 1982

PCT Filed Jun. 5, 1981, Ser. No. 330,309

Int. Cl.³ F16K *3/12, 41/02*

U.S. Cl. 251—327 **3 Claims**



1. A gate valve, comprising: a valve body having an elongated hollow main body portion and a hollow branch body portion extending transversely from said main body portion between the longitudinal ends thereof, said main body portion having a straight flow passage of circular cross section extending lengthwise thereof, said branch body portion having a central cylindrical internal opening extending perpendicular to said straight flow passage and the inner end of which internal opening intersects said straight flow passage, said main body portion having a pair of annular ridges projecting inwardly from the wall of said straight flow passage, said ridges being located on opposite longitudinal sides of and close to the intersection of said straight flow passage and said internal opening, said ridges each having an elongated internal wall which extends parallel with the axis of said flow passage and having radially outwardly extending end walls at the ends of said internal wall, said internal walls of said ridges defining a pair of fixing surface portions having smaller diameters than the portions of said flow passage on opposite sides thereof; a pair of coaxial annular seat rings respectively disposed in said flow passage and extending in opposite longitudinal directions from the intersection of said flow passages and said internal opening, said seat rings having opposed, axially spaced-apart end walls defining valve seats, said seat rings each having a shoulder which abuts against the axially inner end wall of the adjacent ridge and a cylindrical portion which is of greater length than the internal wall of the adjacent ridge and which extends along that internal wall and thence outwardly beyond the axially outer end wall of that ridge, the cylindrical portions of said seat rings being expanded so that the section of said cylindrical portion that is disposed within the internal wall of the adjacent ridge is expanded into facial contact therewith and the remainder of said cylindrical portion is bent radially outwardly so that the edge thereof bites into the wall of said flow passage; said internal opening of said branch body portion including a gate guide chamber extending axially outwardly from said flow passage, said gate guide chamber having a guide hole and guide grooves in the wall thereof; an inside screw threaded portion extending axially outwardly from the outer end of said gate guide chamber and a stuffing box chamber extending axially outwardly from the outer end of said inside screw threaded portion to the outer end of said branch body portion, said stuffing box chamber being of larger diameter than said inside screw threaded portion and having an annular end face at the inner end thereof which end face extends radially inwardly to the outer end of said inside screw threaded portion;

a yoke having an internally screw threaded annular fixing portion which is screw threaded onto said branch body portion; a valve operating screw having a stem that extends through said internal opening of said branch body portion, a gate mounted on the inner end of said stem for movement within said gate guide chamber toward and away from sealing engagement with said valve seats; an annular seat ring sleeved on said stem, said seat ring having an externally threaded portion at the inner end thereof and which is screw threaded into said inside screw thread portion of said internal opening of said branch body portion, said seat ring having a radially outwardly projecting annular flange at the outer end thereof and projecting into said stuffing box chamber, said flange having an inner annular surface opposed to said annular end face of said stuffing box chamber.

4,441,689

BONNETLESS COMPACT DESIGN GLOBE VALVE

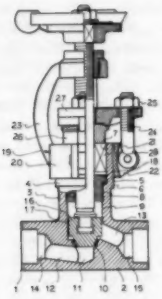
Tomozo Kato, 32-6, Edogawa 6-Chome, Edogawa-ku, Tokyo, 183, Japan

PCT No. PCT/JP81/00132, 371 Date Dec. 10, 1981, 102(e) Date Dec. 10, 1981, PCT Pub. No. WO82/04298, PCT Pub. Date Dec. 9, 1982

PCT Filed Jun. 5, 1981, Ser. No. 333,826

Int. Cl.³ F16K *31/44*

U.S. Cl. 251—366 **3 Claims**



1. An outside screw-type globe valve, comprising:

a one-piece valve body having an elongated main body portion and a branch body portion extending transversely from said main body portion between the longitudinal ends thereof, said main body portion having a through flow passage extending lengthwise thereof, said passage having a stationary valve seat defining a valve opening which is transversely aligned with and opens toward said branch body portion, said through flow passage including inlet and outlet sections which respectively communicate with opposite sides of said valve opening, said branch body portion being hollow and having a central cylindrical internal opening therethrough, said central cylindrical internal opening comprising a disc guide chamber extending axially outwardly from said through flow passage and being transversely aligned with said valve seat, an inside screw threaded portion extending axially outwardly from the outer end of said disc guide chamber and a stuffing box chamber extending axially outwardly from the outer end of said inside screw threaded portion to the outer end of said branch body portion, said stuffing box chamber being of larger diameter than said inside screw threaded portion and having an annular end face at the inner end thereof which end face extends radially inwardly to the outer end of said inside screw threaded portion, said branch body portion having a radially outwardly enlarged head portion at the outer end thereof, said enlarged head portion being externally screw threaded from the outer end thereof to a location close to but spaced outwardly from the inner end of said enlarged head portion; a yoke having an internally screw-threaded annular fixing portion which is screw-threaded onto said enlarged head portion of said branch body portion, the length of the internal screw thread of said annular fixing portion being equal to the length of the external screw thread of said enlarged head portion so that the inner end of the screw thread of said annular fixing portion is bottomed on the inner end of the screw thread of said enlarged head portion; a valve operating screw having a stem that extends through said internal opening of said branch body portion, a valve disc mounted on the inner end of said stem for movement within said disc guide chamber toward and away from sealing engagement with said valve seat; an annular seat ring sleeved on said stem, said seat ring having an externally threaded portion at the inner end thereof and which is screw threaded into said inside screw thread portion of said internal opening of said branch body portion, said seat ring having a radially outwardly projecting annular flange at the outer end thereof and projecting into said stuffing box chamber, said flange having an inner annular surface opposed to said annular end face of said stuffing box chamber, said inner annular surface having ridges which bite into said annular end face to prevent leakage of fluid therepast; and packing material disposed in said stuffing box chamber to prevent leakage of fluid.

4,441,690

DISPLACEABLE WINCH DEVICE

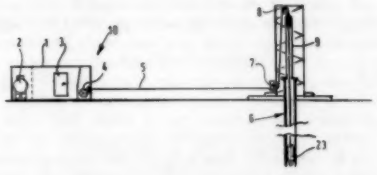
Luitzen B. Koopmans, No. 38a, Gelkemes, 2964 AC Groot-Ammers, Netherlands

Filed Feb. 1, 1982, Ser. No. 344,536

Claims priority, application Netherlands, Feb. 3, 1981, 8100506; Jul. 21, 1981, 8103443

Int. Cl.³ B66D *1/26, 3/00*

U.S. Cl. 254—279 **4 Claims**

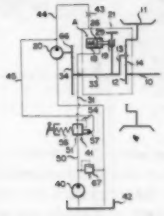


1. A displaceable winch device comprising an external frame, a winch mounted inside said frame and including a cable drum, a driving engine, transmission means coupled with said winch for driving said cable drum from said driving engine, and a control-cabin formed in said frame, characterised in that the frame has the dimensions and characteristics of a standardized transport container, in which the winch, the control-cabin and the driving engine are accommodated, in that the winch is mounted in a winch compartment at one end of the container, in that the control-cabin is adjacent the winch compartment and in that on the side of the control-cabin remote from the winch compartment the container comprises an engine compartment for the driving engine, whilst along the top wall of the container a cooling air supply channel extends from the winch compartment towards the engine compartment.

4,441,691
HOISTING WINCH MOUNTED ON CRANE OR THE LIKE

Hiroshi Nagahara, and Tosio Uchimura, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 22, 1982, Ser. No. 341,752
Int. Cl.³ B66D *1/22, 5/14, 5/22*
U.S. Cl. 254—344 3 Claims



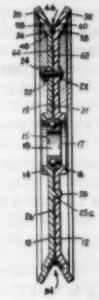
1. A hoisting winch for cranes or the like comprising:
a spooling drum,
an input shaft,
a final reduction drive system interconnecting said input shaft to said spooling drum, said drive system including:
a casing;
a planetary gear system in the casing having a sun gear connected to said input shaft, planet gears engaging said sun gear, a carrier rotatably carrying said planet gears, and a ring gear engaging said planet gears and being connected to said spooling drum;
brake means mounted in the casing adapted to be spring applied and hydraulically released to arrest or release said carrier;
means driven by said carrier for governing brake releasing fluid pressure in proportion to the speed of rotation of said carrier; and
a manually adjustable pressure reducing valve means for supplying pressurized fluid delivered by a hydraulic pump by a prime mover into said brake means thereby releasing the braking force and for reducing and controlling the pressure of the pressurized fluid directed into said brake means in response to action of said means driven by rotation of said carrier.

4,441,692
RUBBER-LAGGED SHEAVE

Joseph J. Kovaleski, Easton, Conn., assignor to Wyrepak Industries, Inc., Bridgeport, Conn.

Filed Apr. 30, 1982, Ser. No. 373,325
Int. Cl.³ B66D *1/36, 1/00*; F16H *55/48*
U.S. Cl. 254—390 20 Claims

1. A sheave which is lagged with rubber or rubber-like material, comprising in combination:
(a) a disc-like member having means at its center, providing a bearing by which the member can be rotatably mounted on a spindle,
(b) said disc-like member having an annular peripheral portion which is laterally offset axially of the axis of the member,
(c) a cooperable annular member having a peripheral offset portion which is complementary to the offset portion of the disc-like member,
(d) means for securing said members together in broadside relation whereby the offset peripheral portions thereof form an annular groove for receiving and guiding a strand of material,
(e) said members having oppositely-disposed wall portions adjacent their peripheral portions, which together form an annular recess with re-entrant side walls,
(f) each of said members being characterized by an annular retention groove disposed opposite and coextensive with the retention groove of the other member, the walls of said retention grooves constituting the said re-entrant side walls, and
(g) a wear strip of relatively soft, resilient material having an elongate rib which is accommodated in and frictionally

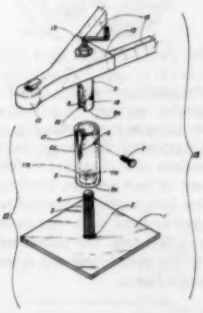


seized by the re-entrant side walls of said annular recess, said wear strip being characterized by a one-piece cross-sectional configuration and extending along the said recess and presenting an annular exterior space for receiving a strand of material which is being passed around the sheave.

4,441,693
JACK ACCESSORY SUPPORT LEG FOR TRAILER HITCH

Sidney Silver, 1303 Marie St., Hattiesburg, Miss. 39401

Filed Jun. 1, 1982, Ser. No. 383,763
Int. Cl.³ B66F *3/10*
U.S. Cl. 254—420 4 Claims



1. An improvement in a trailer hitch support system including
a trailer hitch; and
jack up means having a jack leg, attached to the hitch for intermittently supporting the trailer hitch end of a trailer on a support surface; the improvement comprising:
a base support member removeably attached to the jack leg; said base support member comprising
a laterally extended base plate member having an extended flat surface on its underside for contacting in face-to-face engagement the support surface;
a threaded stud fixedly attached to said base plate member and extending vertically up from the center area of the upperside of said base plate member;
a connector formed from an at least generally cylindrical,

pipe section member associated with said threaded stud, said connector havin threaded portion means defining a threaded opening for matingly and threadingly engaging said threaded stud for allowing the separation distance between said base plate member and said connector to be varied, said connector further including a cylindrical section having a bottom opening, said threaded portion comprising a threaded nut fixedly attached to said pipe section member with is threaded interior communicating in line with said bottom openings, said connector further including a bottom plate with a centrally located opening, said bottom plate being welded to the bottom portion of said connector, said nut being enclosed within said pipe section member and being welded to the upper side of said bottom plate with its threaded interior communicating in line with said centrally located opening; and

fastening means associated with said connector for fastening said connector and hence said base plate member to the lower end of the jack leg.

4,441,694

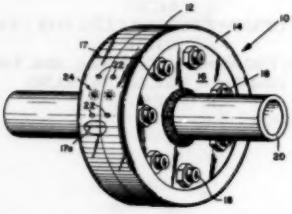
METHOD OF MANUFACTURING A SAFETY SHIELD FOR FLANGED PIPE COUPLINGS

Donald G. Curran, Norwood, Pa., and Robert A. Anderson, Sewell, N.J., assignors to Bunnell Plastics, Inc., Mickelton, N.J.

Division of Ser. No. 229,083, Jan. 28, 1981, Pat. No. 4,403,794. This application Feb. 22, 1983, Ser. No. 468,609

Int. Cl.³ B28B 7/14

U.S. Cl. 264—163 **3 Claims**



1. A method for making a safety shield which comprises subjecting an annular section of a heat-shrinkable tubing formed of a fluoropolymer to shrinking conditions while substantially restricting radial shrinkage thereof except along marginal edge portions of said section to form flanges extending radially inward of said section, cooling said section and cutting said section longitudinally thereof to form an arcuate strip having flanges integral with and extending along each longitudinal edge of said strip, and providing means at the end edges of said strip for connecting the opposing ends of said strip in overlapping relation.

4,441,695

PIPE CUTTING MACHINE

Donald R. Watts, 6004 4th Ct. NE., Tacoma, Wash. 98422

Filed Feb. 14, 1979, Ser. No. 12,153

Int. Cl.³ B23K 7/04

U.S. Cl. 266—57 **10 Claims**

1. A pipe cutting machine comprising:

a frame;

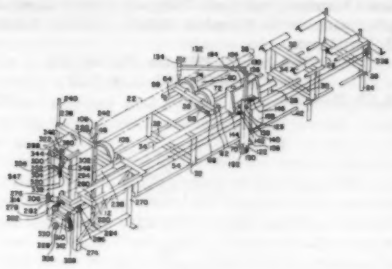
a torch which is affixed to the frame;

a means for rotating a pipe which is secured to the frame;

a means for translating the rotation of the pipe to a first cam;

a means for translating the rotation of the pipe to a second cam;

a means for translating the rotation of the first cam such that the rotation of the first cam is capable of translating the rotation of the first cam to the torch such that the torch is capable of cutting a saddle cut on the pipe; and



a means for translating the rotation of the first cam and second cam such that the translation of the first cam and second cam to the torch such that the torch is capable of cutting a combination of saddle and mitre cuts on the pipe.

4,441,696

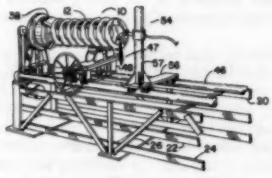
HELICAL COIL SPRING END FORMING

Robert W. Buzinski, Hebron, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 100,017, Dec. 3, 1979, abandoned. This application Jul. 2, 1981, Ser. No. 279,863

Int. Cl.³ B23K 7/10

U.S. Cl. 266—57 **1 Claim**



1. A flame cutting device for cutting the end of a coil spring including:

a base table structure having front and rear vertical support posts, horizontal members joining said front and rear vertical support posts, crosswise members supporting said horizontal members, and at least two guide members affixed to said front and rear vertical support posts,

a rotating mechanism affixed to said front vertical support post, said rotating mechanism comprising driving means and connection means, said connection means being adapted to hold a coil spring at one end thereof and said connection means being adjustable in height to accommodate different sized coil springs,

roller means located on said guide members adapted to support the coil spring,

flame cutting means comprising a support column affixed to said guide members in a manner that said support column can be moved along said guide members, and a flame cutting torch affixed to said support column in a manner such that said flame cutting torch can be moved up and down along said support column, said flame cutting torch extending into the interior central section of the coil spring being cut,

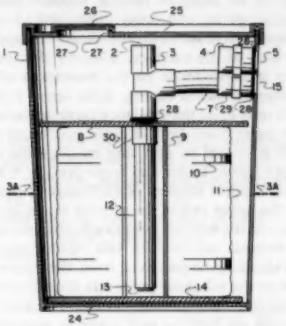
wherein by the rotation of said rotating mechanism and connection means, the coil spring held in said connection means can be cut at its other end by said flame cutting torch to form a flat surface on said end.

4,441,697

SILVER RECOVERY UNIT

Donny L. Peterson, Baytown, and Michael L. Butts, Houston, both of Tex., assignors to William E. Tipton, Jr., Houston, Tex.

Filed Jan. 29, 1982, Ser. No. 344,099
Int. Cl.³ C22B 5/00
U.S. Cl. 266—170 17 Claims



1. Apparatus for recovering silver from a silver-containing solution, comprising:

a container constructed of material that is non-reactive with the solution;

influent means connected to the container for introducing solution into the container;

effluent means connected to the container at a height below that of the influent means for removing solution from the container;

core means of elongated shape and being closed at its lower end and connected to said effluent means at its upper end, said core means having a longitudinal passageway extending therethrough, and said core means having an aperture in the side thereof;

splash guard means, having upper and lower surfaces, said splash guard means connected to the upper end of the core means at a height below that of the level of the influent means, for dispersing the solution entering the container;

inner filler means peripherally disposed about the core means, said inner filler means being formed from a metal above silver in the electromotive force series;

baffle means having upper and lower edges and being peripherally disposed about the inner filler means, said baffle means being contructed of material that is non-reactive with the solution, and wherein the upper edge of said baffle means is attached to the lower surface of said splash guard means, and the lower edge of said baffle means rests on the bottom of the container, and said baffle means having an aperture in the side thereof; and

outer filler means peripherally disposed about the baffle means, said outer filler means being formed from a metal above silver in the electromotive force series.

4,441,698

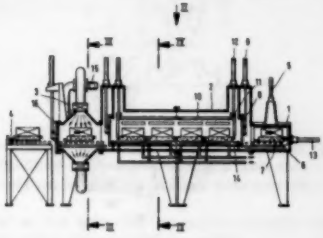
FURNACE FOR THE HEAT TREATMENT OF DRILLS

Ferdinand Limque, Beatrixlaan 20, Berg en Dal, Netherlands; Cornelis H. Luiten, Nimwegen, Netherlands; Franz Bless; Reinhard Neubauer, both of Kleve, Fed. Rep. of Germany, and Dietmar Lange, Rees, Fed. Rep. of Germany, assignors to Ferdinand Limque, Berg en Dal, Netherlands

Filed Mar. 8, 1982, Ser. No. 355,782
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111218
Int. Cl.³ C21D 1/00
U.S. Cl. 266—249 14 Claims

1. In a furnace having a heating area and a quenching area for a partial heat-treatment of drills and other tools having a clamping portion and a working portion in which different properties, particularly hardness, are to be imparted by a heat treatment solely to the working portion, the improvement comprising

a tool receiving member movable in said furnace from said heating area to said quenching area, said tool receiving member including means for holding a plurality of said tools such that the working portion of the tools is freely exposed to the heating and quenching as said tool receiving member moves from said heating area to said quenching area, and means for maintaining the clamping portion of said tools at substantially the same temperature level during the heating and quenching,



said tool receiving member comprises a plate-like support member including a plurality of recesses of predetermined size to engage with the respective clamping portions of said tools such that the working portion of said tools projects away from said support member,

means for cooling said support member to maintain said clamping portions at said temperature level during the heating,

the heating area has a hearth engageable with said support member and said hearth includes said means for cooling said support member, and

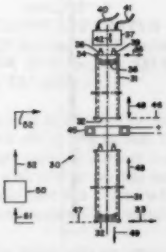
said hearth includes cooling channels formed therein to receive a flow of coolant.

4,441,699

APPARATUS FOR ANNEALING OF END RIM

Helmuth Supik, Sarstedt, Fed. Rep. of Germany, assignor to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 226,988, Jan. 21, 1981, Pat. No. 4,372,719.
This application Sep. 30, 1982, Ser. No. 432,047
Int. Cl.³ C21D 9/00
U.S. Cl. 266—255 8 Claims



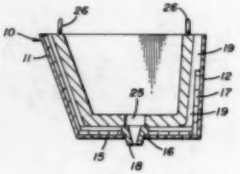
1. A device comprising means for annealing a peripheral flange area only of a can end formed by stamping the can end from a hard-to-deform ferrous metal strip, said means including a fixed annular inductive annealing device, carrier means defining an inert atmosphere, and for receiving a can end in said inert atmosphere, and means for moving said carrier

means and at least one can end through said annular inductive annealing device to anneal only the peripheral flange area of the can end.

4,441,700
BLAST FURNACE TROUGH AND LINER COMBINATION

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 261,678, May 7, 1981, Pat. No. 4,372,544. This application Sep. 29, 1982, Ser. No. 428,091
The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.
Int. Cl.³ C21B *3/00*
U.S. Cl. 266—281 **10 Claims**



1. An improvement in a blast furnace trough and liner combination for handling hot metal, the improvement comprising a replaceable and expendable liner and cushioning and insulating means supporting the same, said blast furnace trough comprising an open topped apertured receiving vessel, and the replaceable and expendable liner comprising a multi-layered mass coalesced by vibratory physical force with each of said multilayers being of a different density and having a known predetermined lifetime when subjected to molten metal flowing thereover.

4,441,701
APPARATUS FOR SUPPORTING AND GUIDING A SUB-LANCE

Nicolaas H. Beentjes, Uitgeest, and Peter Gootjes, Alkmaar, both of Netherlands, assignors to Estel Hoogovens B.V., Netherlands

Filed Sep. 17, 1982, Ser. No. 419,184
Claims priority, application Netherlands, Sep. 25, 1981, 8104325
Int. Cl.³ C21C *5/46*
U.S. Cl. 266—287 **2 Claims**

1. Apparatus for supporting and guiding a sub-lance which carries out measurements and/or taking of samples in a metallurgical furnace, said apparatus having

(a) a guide track,

(b) a sub-lance carriage to support the sub-lance and displaceable upwardly and downwardly along said guide track while being guided by the track,

(c) a sub-lance guide displaceable upwardly and downwardly along said guide track below the sub-lance carriage while being guided by the track,

(d) support means for the sub-lance guide consisting at least partly of an elongate flexible support element for the sub-lance guide, and being connected to said sub-lance carriage so as to move therewith over an upper portion of the travel of the carriage, whereby the sub-lance guide moves in dependence on the movement of the carriage said support means having, at its upper end, a cross-bar which rests upon the sub-lance carriage during movement of the latter over the said upper portion of its travel and which is caught by said stop means when the sub-lance carriage moves below said upper portion of its travel, said flexible support element of said support means extending from the upper end of the support means to the sub-lance guide, and the support means including two tubular covering elements surrounding said flexible support element and extending respectively from the upper end thereof and from the sub-lance guide into the said tubular guide so that the lengths of the support element outside the tubular guide are enclosed by said covering elements at all positions of the sub-lance guide,

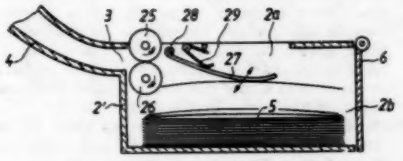
(e) stop means to hold said support means, located in a fixed position relative to said guide track, so that, on movement of the carriage below said upper portion of its travel, the support means is held by stop means, and

(f) a tubular guide housing said support means over at least part of the distance from said stop means to the upper end of the travel of the sub-lance guide.

4,441,702
DEVICE FOR COLLECTING AND STACKING PHOTOGRAPHIC PRINTS

Erich Nagel, Ansing, and Rainer Türcke, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 971,371, Dec. 20, 1978, abandoned. This application Nov. 7, 1980, Ser. No. 206,858
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757849
Int. Cl.³ B65H *29/42, 29/38*
U.S. Cl. 271—177 **1 Claim**



1. A device for collecting and stacking photographic print, particularly paper prints discharged from a cutting apparatus, comprising a container having an inlet opening adapted for receiving said prints, an interior defining an input area in alignment with said inlet opening, a stacking area adjoining said inlet area, and an outlet opening; feeding means arranged in said input area for accelerating the incoming prints and discharging them into said stacking area at an increased speed; a tiltable flap arranged at said outlet opening to hold the prints in, and alternatively, to release the prints from said stacking area; and means for adjusting the position of said flap relative to said outlet opening according to different sizes of said prints; said inlet opening being arranged in a lateral wall of said container to feed said prints in a direction which is parallel to the outlet opening of said container, said feed means including a

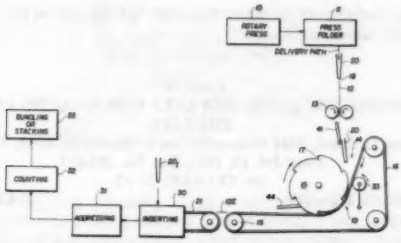
pair of contacting rollers driven for discharging each print at an increased speed against the opposite wall of said container, said opposite wall being spaced apart from said feed means at a distance which is larger than the length of said prints, the top wall of said container supporting a tiltable press pad which is spring-biased for urging each print after its rebouncing from said opposite wall towards said stack of prints.

4,441,703

PRESS DELIVERY SYSTEM WITH PRECISION PRODUCT TIMING AND ALIGNMENT

Hans G. Faltin, York, Pa., assignor to Custom-Bilt Machinery, Inc., York, Pa.

Filed Aug. 10, 1981, Ser. No. 291,481
Int. Cl.³ B65H *9/04*
U.S. Cl. 271—243 **2 Claims**



1. A high speed newspaper press delivery and processing system operable to receive papers exiting the press to precisely time, synchronize and locate them in a transport path and on-line processing system, comprising in combination,

(a) means delivering at a transit speed folded papers from a high speed printing press along a predetermined delivery path,

(b) a rotary timing placement and synchronizing member having a predetermined rotation speed and a substantially circular profile tangentially meeting said delivery path with a surface speed less than said transit speed and having a set of evenly spaced paper stop notches located about the circular periphery thereby to receive and space and shingle at a predetermined spacing the papers from said press with the papers in place in the notches constituting the outer circumferential shingled surface layer on the outermost circumferential surface of the rotary member,

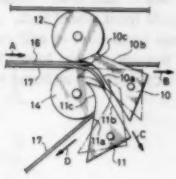
(c) a moving belt contacting an arc on the circular periphery of said rotary member from the intersection of the delivery path to a substantially lowermost position on the periphery thereby to contact the surface layer defined by the shingled papers between the belt and rotary member, to advance the papers at said rotation speed while holding them in a circumferentially fixed spacing and alignment and to discharge the papers in a continuous stream moving at the rotary member surface speed in a substantially horizontal direction tagential to the movement of the drum to continue transport in the same direction with a precision alignment and spacing identical to that between said notches, and conveyor means synchronously moving with rotation of said rotary member for receiving the papers in said precision spacing and alignment for transport away from the rotary member to on-line processing stations.

4,441,704

THREE DIRECTION CHANGEABLE GUIDE DEVICE FOR USE IN A BANK NOTE HANDLING MACHINE

Isamu Uchida, and Yoshiyuki Imamura, both of Tokyo, Japan, assignors to Luarel Bank Machine Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1981, Ser. No. 325,009
Claims priority, application Japan, Dec. 5, 1980, 55-175417[U]
Int. Cl.³ B65H *29/58*
U.S. Cl. 271—303 **5 Claims**



1. A three direction changeable guide device for use in a bank note handling machine in which bank notes are conveyed and selectively guided into one of these directions which comprises:

a number of first belts (16) disposed to transfer the bank notes in a first direction (B) therealong,

a like number of second belts (17) one each disposed to partially engage with one of the first belts (16) and to transfer the bank notes in a second direction (D) along the second belts (17),

a like number of pulleys (14) one each disposed to deflect one of the second belts (17) from the first direction (B) to second direction (D),

a like number of first forks (10) one each disposed adjacent and downstream of one of the pulleys (14) in the first direction (B) and adapted to swingably project above the level of the first belts (17) to obstruct the movement of the bank notes in the first direction (B), and

a like number of second forks (11) one each disposed adjacent and downstream of one of the pulleys (14) and the first forks (10) and adapted to swingably project above the level of the second belts (17) to obstruct the movement of the bank notes in the second direction (D),

the first forks (10) and the second of forks (11) being disposed to define therebetween a path for bank notes in a third direction (C) when the first forks obstruct the movement of the bank notes in the first direction (13) and the second forks (11) hinder the movement of the bank notes in the second direction (D).

4,441,705

EXERCISING APPARATUS

Lawrence G. Brown, 1629 Kuhilani St., Honolulu, Hi. 96821

Filed Aug. 14, 1978, Ser. No. 933,470
Int. Cl.³ A63B *69/16*
U.S. Cl. 272—73 **12 Claims**

1. Exercising apparatus for simulating the characteristics of exercise during the actual riding of a bicycle comprising:

a self supporting unitary stationary frame means for mounting components of a bicycle or the like including at least a frame, a seat, handle bars and a front wheel fork, a rear wheel, crank arms and pedals, and a pedal operated drive system;

driven wheel means for frictionally engaging the rear wheel for rotation by the rear wheel to simulate engagement with the ground during the actual riding of a bicycle;

flywheel means operatively connected to said driven wheel means for energy storage during rotation of the rear wheel to simulate momentum during actual riding of a bicycle;

variable load applying means operatively connected to said driven wheel means for applying variable loads to said

driven wheel means to simulate variations in load encountered during actual riding of a bicycle;

said self supporting unitary stationary frame means comprising:

lower support means for non-attachable self supporting placement on the ground or a floor for unitary support of the bicycle components and said driven wheel means and said flywheel means and said variable load applying means;

a front post means connected to and extending upwardly from the front end of said lower support means for supporting the bicycle front wheel fork;

a center post means connected to and extending upwardly from a central portion of said lower support means for supporting the bicycle frame adjacent the crank arms and the pedals;

rear support means connected to and extending upwardly from a rear portion of said lower support means for supporting said driven wheel means and said flywheel means and said variable load applying means, the rear wheel being supported only by said driven wheel means;

first mounting means associated with said front post means for attachment of the front wheel fork of a bicycle upon removal of the front wheel of the bicycle;

second mounting means associated with said center post means for engagement with a portion of the bicycle frame next adjacent the pedals and crank arms of the bicycle; and

said driven wheel means and said flywheel means and said variable load applying means being located rearwardly of the crank arms and pedals in juxtaposition to the lowermost portion of the rear wheel.

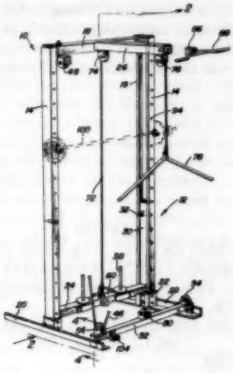
4,441,706

WEIGHT LIFTING TYPE EXERCISING DEVICE

Mark M. Korzaniewski, 187 Nancy Crest La., West Seneca, N.Y. 14224

Filed Sep. 30, 1982, Ser. No. 431,793
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—118 **10 Claims**

1. An exercising machine comprising a vertical framework including a pair of parallel side members of channel-shaped configuration with the side members facing inwardly, a top member rigidly interconnecting the upper ends of the side members, means supporting the lower ends of the side members, a slide vertically slidable in each side member with each slide including an elongated slide member slidably mounted in the side member and a laterally extending arm at the lower end of the slide member with the arms extending toward each other but terminating in spaced relation, each of the arms including an upstanding peg for receiving weights, a cable attached to each of the slide members and extending upwardly to the top member, a pulley assembly on the top member receiving each of the cables, each of said cables having a handle means at the



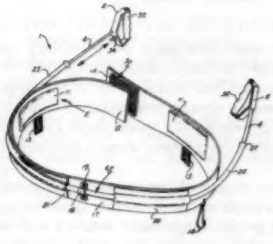
free end thereof to enable the slides individually to be vertically raised and lowered.

4,441,707

ISOMETRIC EXERCISER BELT FOR JOGGERS AND THE LIKE

Jack L. Bosch, 2451 Wisconsin, North Muskegon, Mich. 49445

Filed Jul. 15, 1981, Ser. No. 283,612
Int. Cl.³ A63B *21/12*
U.S. Cl. 272—119 **26 Claims**



1. An isometric exercise device for joggers and the like, comprising:

a belt shaped for encircling the waist of a jogger;

means for selectively retaining said belt securely about the waist of the jogger in a selected orientation;

a flexible line being substantially inelastic

first and second handles connected to opposite ends of said flexible line;

means for slidingly receiving said flexible line generally along the longitudinal axis of said belt for longitudinal, reciprocating motion of said flexible line with respect to said belt; said receiving means including substantially rigid members that extend forwardly from positions that are generally in the direction of a user's arms when said arms are extended forwardly in front of a user to support said handles forwardly and between the arms of the user, and thereby keep said flexible line out of contact with the arms of the jogger during isometric exercising therewith;

means for detachably connecting said handles to said belt at opposite locations thereon which retains said handles and said attached flexible line in a storage position, out of contact with the legs of the jogger when the jogger is running, whereby during operation, the user detaches the

handles from said belt, grasps said handles in opposite hands, and alternately pushes one handle forwardly, while simultaneously resisting rearward movement of the other handle, thereby isometrically exercising arm and upper body muscles at the same time as the lower body muscles of the jogger.

4,441,708

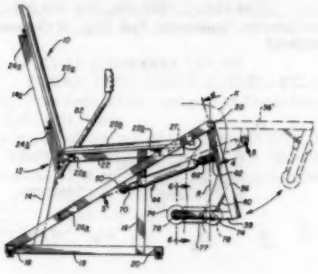
DOUBLE LEG CURL EXERCISING DEVICE

Jerry D. Brentham, P.O. Box #599, Belton, Tex. 76513

Continuation of Ser. No. 959,688, Nov. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 914,356, Jun. 12, 1978, Pat. No. 4,254,949. This application Sep. 23, 1981, Ser. No. 304,766

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—130 **8 Claims**



5. A leg curl exercising device to strengthen the legs and knees of a user, comprising: a support frame; a seat support member on said support frame; a back support member on said support frame, said seat support member and said back support member being oriented relative to one another at an obtuse angle to support the body of a user in a sitting position; a pair of exercise arms to permit independent and combined exercising movement of the legs of the user, each exercise arm being independently and pivotally secured to a side of said support frame with the axis of rotation of the exercise arms being substantially aligned with the axis of rotation of an adjacent knee of the user; leg gripping means secured to the outer end of each arm for gripping a user's leg by engaging opposed sides of each leg of the user; a pair of cylinders having fluid disposed therein; means pivotally securing a first end of each said cylinder to each side of said support frame; a pair of piston rods; means pivotally securing an end of each of said piston rods to one of said arms; a piston slideably disposed in each cylinder and secured to the other end of each piston rod; means resisting flow of fluid from one side of each said piston to the other side of said piston for resisting movement of each arm independently in each direction between a position with the leg below the knee of the user being an an acute angle relative to the leg above the knee and a position with the leg being substantially extended; and hand support means upwardly of the seat support member and forwardly of the back support member on each side of said support frame to limit movement of the body of a user sitting on said seat support member.

4,441,709

MOVABLE BASKETBALL HOOP STRUCTURE

Edward A. Schroeder, Algonquin, and William F. Donat, Franklin Park, both of Ill., assignors to Porter Equipment Co., Schiller Park, Ill.

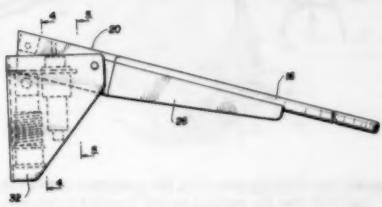
Filed Oct. 19, 1981, Ser. No. 312,990

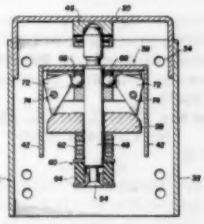
Int. Cl.³ A63B *63/08*

U.S. Cl. 273—1.5 R **15 Claims**

11. In a mounting assembly for a horizontal basketball goal hoop structure having support structure for mounting to a backboard, means for pivotally mounting said hoop structure to said support structure, lock means for maintaining said hoop structure until a predetermined force is applied to said hoop structure and return means for returning said hoop structure to said horizontal position, the improvement comprising:

said return means includes a rail with a first seat secured thereto and a second seat mounted thereto, compression means positioned between said first and second seats, said rail and said second seat being connected between said hoop and said support structures so as to move relative to each other and compress said compression means when





said hoop structure pivots on said support structure from said horizontal position;

said lock means includes a detent having a locked position and an unlocked position; and

interconnect means connecting said detent and said compression means for biasing said detent with said compression means and for transmitting the movement of said detent from said locked to said unlocked position to move said second seat relative to said rail of said for increasing the compression means.

4,441,710

BOWLING RAMP ATTACHMENT FOR WHEELCHAIRS

Larry D. Lay, 26078 Alger, Madison Heights, Mich. 48071

Continuation-in-part of Ser. No. 178,952, Aug. 18, 1980, Pat. No. 4,368,898. This application May 21, 1982, Ser. No. 380,519

Int. Cl.³ A63D *5/00*

U.S. Cl. 273—54 R **13 Claims**

10. A bowling ramp comprising:

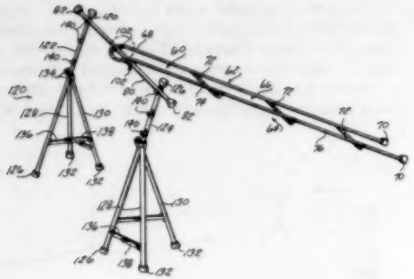
first and second spaced, upwardly extending support posts adapted to rest on the floor at one end;

means for supporting the first and second support posts in an upright manner on the floor, the supporting means including a plurality of leg members connected at one end to an intermediate portion of each of the first and second support posts and extending downwards and outward therefrom and engaging the floor at a second end spaced from the first and second support posts;

a cross bar extending laterally across the first and second support posts;

means for adjusting the vertical height of the cross bar with respect to the floor;

means for guiding a ball from the cross bar to the floor; and



means for slidingly attaching the guiding means to the cross bar such that the guiding means is movable laterally across the cross bar.

4,441,711

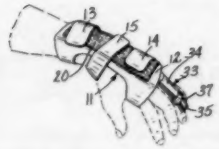
WRIST AND RING FINGER SUPPORT FOR BOWLER

Kenneth W. Dubar, 36 Northfield Rd., Wallingford, Conn. 06492, and Armadio J. Onofrio, 44 Woodland Ave., North Haven, Conn. 06473

Filed Sep. 20, 1982, Ser. No. 420,269

Int. Cl.³ A63B *69/00*

U.S. Cl. 273—54 B **4 Claims**



1. A wrist and finger support for bowlers comprising, in combination, a glove-like element and a rigid support piece,

the glove-like element being of flexible fabric shaped to include,

a rectangular body portion having a length sufficient to extend from the user's knuckles to a point proximally beyond the wrist,

a first elongated strap element integral with the body portion and extending from a point along a first edge of said portion which is adjacent one end of said portion, laterally in a direction substantially normal to the long dimension of the body portion.

a second elongated strap element integral with the body portion and extending from a point along said first edge which is adjacent the other end of said portion laterally in a direction substantially parallel to that of said first strap,

a third elongated strap element integral with the body portion and extending from a point along a second edge of said portion which point is spaced from each end of said portion, each of said straps having a body portion end and a free end,

an area of releasably adherent material mounted on one surface of said body portion,

areas of releasably adherent material adjacent the free ends of each strap on a surface adapted to cooperate with the area of adherent material on the body portion,

an elongated pocket element fixed to the body element longitudinally thereof and having an open end adjacent the knuckle end of said body element, and

the support piece being of substantially rigid material shaped to include, a substantially rectangular elongated planar body portion, a finger supporting extension integral with the support body portion at one end thereof and angled both out of the plane of said portion in the direction toward the user's fingers and away from the longitudinal axis of the support body portion toward the user's ring finger,

said extension being arcuate in transverse cross-section and provided with padding on its concave surface.

4,441,712

TENNIS RACKET STRING MOUNT

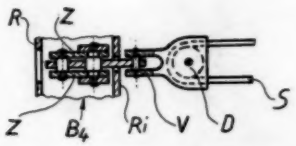
Horst Guthke, Münchener Str. 17, 8011 Forstern, Fed. Rep. of Germany

Filed Oct. 7, 1981, Ser. No. 309,398

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038663

Int. Cl.³ A63B *49/02, 51/12*

U.S. Cl. 273—73 D **20 Claims**



1. A tennis racket comprising a frame; strings supported in said frame and connected thereto, said strings reciprocally moving between an inoperative and operative position and diverging from said inoperative position into said operative position when impinged by a tennis ball, said frame being at least partially hollow and including an interior wall and an exterior wall and having an inner boundary facing said strings and an outer boundary facing away from said strings; connecting elements for connecting said strings to said frame; and intermediate members interconnected between said connecting elements and said frame, said connecting elements being pivotally mounted to said frame at respective pivots located in the proximity of said outer boundary of said frame and mounted between said frame and said intermediate members, each of said connecting elements being adapted to pivot about a respective pivot normally to the elongation of the respective string in the inoperative position so that when the strings are in said operative position they form with said frame active connection points which are positioned in the region extended outwardly from said inner boundary in a direction away from the strings, said connecting elements including portions provided with additional pivots operatively connected to the respective strings.

4,441,713

METALLIC TENNIS RACKET WITH TORSION-RESISTANT HANDLE

Francis S. Van Dyck, Borsbeek, and Thierry M. Dumortier, Hermee, both of Belgium, assignors to Fabrique Nationale Herstal, Belgium

Filed Apr. 7, 1982, Ser. No. 366,382

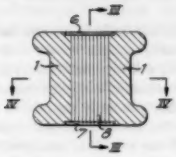
Claims priority, application Belgium, Aug. 14, 1981, 2/59300

Int. Cl.³ A63B *49/12*

U.S. Cl. 273—73 J **1 Claim**

1. An improved tennis racket having enhanced torsional rigidity comprising a frame of a single metallic profile to form a head, a throat-piece and a tail, the portion of the frame defining said head comprised of substantially only said single metallic profile, the throat-piece being disposed between the head

and the tail, the tail being defined by two parallel ends of the profile, two parallel metal plates extending over only substantially the full length of the tail for securing the two parallel



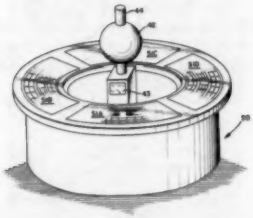
ends together at a predetermined distance from each other, the parallel ends and the metal plates collectively defining a box space, and a metal honeycomb disposed only within the box space and secured to at least the plates or parallel ends.

4,441,714

POKER-TYPE TABLE GAME

Joseph Goott, Great Falls, Mont., assignor to Tropic Industries, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 43,678, May 30, 1979, Pat. No. 4,364,567. This application Oct. 17, 1980, Ser. No. 198,175
The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.
Int. Cl.³ A63F *1/00*
U.S. Cl. 273—144 B **12 Claims**



1. A game playable by at least one person, comprising a game board having means associated with the surface thereof for designating a plurality of positions corresponding to combinations and values as occur in a card game; and means associated with said at least one game board for selecting a number of balls corresponding to the number of cards dealt in a card game hand from a group of balls representing each of the cards in a deck of playing cards and displaying the results of the balls selected at one or more of the positions on the surface of said at least one game board, said position-designating means including a first series of defined areas actuatable to notify each player guessing with respect thereto if the selected ball associated with that area has a value of "9", "10", Jack, Queen, King, or Ace and a second series of defined, areas in line with said first series and selectively actuatable to notify each player guessing with respect thereto if the selected ball associated with that area has a value of "2", "3", "4", "5", "6", or "7".

4,441,715

SPHERICAL PUZZLE

Stephen C. Titus, 1210 Arlington Blvd., Ann Arbor, Mich. 48104

Filed Apr. 5, 1982, Ser. No. 365,502
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **14 Claims**

1. A spherical puzzle comprising a plurality of sections formed by longitudinal planes intersecting along a common line between diametrically opposite poles on the sphere and intersecting the surface of the sphere with each of said sections extending from pole to pole, said plurality of sections divided into two equal sets of sections with members of each set alternating in position with members of the other set about the equator of said sphere and with the total number of sections comprising the sphere defined by $4N+2$ where N is a positive integer, and,

means attaching said sections together to form said sphere, said attaching means on one set identical on both planes of

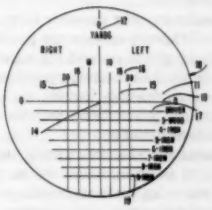
each section of the one set and the attaching means on the other set identical on both planes of each section of the other set, said attaching means on the one set being complementary to the attaching means on the other set, said attaching means including means to permit relative hemispherical rotation between any two hemispherical groups of sections separated by a longitudinal plane.

4,441,716

GOLF BALL INCLUDING ALIGNMENT MARKINGS AND GOLF BALL MARKING DEVICE

Richard M. Chen, 51-52 Goldsmith St., Elmhurst, N.Y. 11373

Filed Jul. 10, 1981, Ser. No. 282,054
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—183 C **10 Claims**

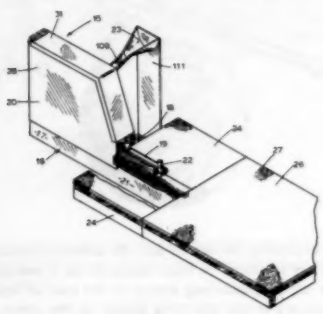


1. A golf alignment device comprising; a golf ball being formed with markings on said ball, said markings comprising first and second perpendicularly crossed lines, and a first plurality of lines parallel to said first line, and a second plurality of lines parallel to said second line, whereby the first line and first plurality of lines are determinative of the angular direction of the ball flight and the second line and second plurality of lines are determinative of the arc of the ball flight with respect to the horizontal, said pluralities of lines lying in one hemisphere of said ball, said lines of said first plurality bearing respective notations as to the angular deviation of the ball flight with respect to the vertical, said second plurality of lines bearing respective notations as to the arc of the ball flight, said ball in use being aligned so that the one hemisphere and crossed lines face the direction of golf club impact, and whereby when the golf club impacts the ball, an impact mark is produced in said one hemisphere, and wherein the center of the impact mark relative to said lines determines the angular deviation and arc of the flight of the ball as denoted by said notations.

4,441,717
GOLF BALL PRACTICE DRIVING APPARATUS

Leland J. Willcox, 75 Queens Dr., 7085 SE. Bloomfield Rd., Des Moines, Iowa 50320

Filed Mar. 24, 1980, Ser. No. 132,902
Int. Cl.[3] A63B 57/00
U.S. Cl. 273—201 5 Claims



1. A golf ball practice driving apparatus for successively teeing up golf balls comprising:

(a) a ground supported upright frame structure including a base member having a section projected from one end of said frame structure,

(b) a tee member projected upwardly from said base section and movably supported on said base member for movement from an upper ball receiving position to a lower ball driving position, said tee member movable from the ball receiving position to the ball driving position therefor by the weight of a ball received threreon,

(c) a container for golf balls mounted on an upper portion of said frame structure having a discharge chute for a single row of golf balls,

(d) means on said frame structure for releasing only the lead ball from said chute,

(e) a ball transfer member movable from a first position to receive a ball thereon to a second position to transfer the ball to a teed position on said tee member, when the tee member is in the ball receiving position therefor,

(f) first means for releasably locking the transfer member in said first position, when the tee member is in the lower ball driving position therefor,

(g) second means for releasably locking the transfer member in said second position, when the tee member is in the upper ball receiving position therefor,

(h) means interconnecting said transfer member and tee member for actuation of said first releasable locking means and said second releasable locking means in response to the concurrent movements of the tee member and the transfer member,

(i) said transfer member, when the tee member is in the upper ball receiving position therefor, being releasably locked by said second locking means on movement thereof from the first position to the second position therefor in response to the weight of a ball delivered thereon from said chute and being sequentially released by the second locking means for movement from the second position to the first position therefore, and releasably locked in the first position therefor by the first releasable locking means, in response to the movement of the tee member from the upper ball receiving position to the lower ball driving position therefor,

(j) said first releasable locking means being released in response to the driving of a ball from the tee member to provide for the movement of the transfer member from the first position to the second position therefor, in response to the weight of a next lead ball delivered from the chute,

(k) means for releasing the lead ball for delivery on the transfer member in response to movement of the transfer member from the second position to the first position therefor,

(l) said first releasable locking means including a first stop abutment pivotally supported on said base member for movement about a first transverse axis, and

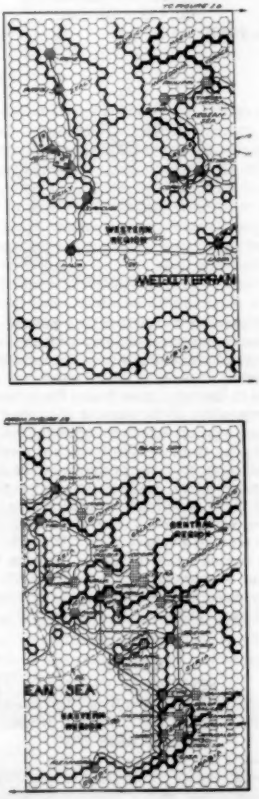
(m) said second releasable locking means including a second abutment member pivotally supported on said base member for movement about a second transverse axis spaced longitudinally from said first transverse axis, and

(n) a latch abutment common to said first and second stop abutments movably connected to the transfer member for movement into locked engagement with one or the other of said first and second stop abutments in response to the concurrent movements of the transfer member and tee member.

4,441,718
BIBLICAL GAME

Mark J. Olson, 1909 Woodlyn Dr., Apt. 104, Fredericksburg, Va. 22401

Filed Aug. 27, 1981, Ser. No. 297,081
Int. Cl.[3] A63F 3/04
U.S. Cl. 273—242 13 Claims



1. An educational and entertaining game for a number of participants, comprising:

a game board with a plurality of playing spaces arranged thereon, having indicia thereon associated with a part of the map of the world,

a plurality of player boards, at least two for each participant, each player board having a plurality of sections with respective predetermined indicia including a first area with indicia designating a unique identity as amongst all said player boards and a second area with at least a space movement factor indicia assigned to the respective unique identity and a plurality of different ability factor indicia related to the abilities of the respective identity,

at least two moveable game pieces per participant for movement from playing space to space on the game board, each game piece having two different kinds of indicia one of which is said unique identity and the other of which is said space movement factor indicia for determining the number of spaces the respective game piece may be moved by the respective participant for the respective unique identity,

a plurality of marker pieces each having distinguishing indicia provided thereon to correlate said abilities for placement on various possible predesignated ones of said spaces to mark the achievement thereat of said unique identities,

plurality of tallying pieces having different distinguishing indicia provided thereon for tallying certain conditions at said pre-designated spaces,

first chance means for losing or gaining said tallying pieces, and

second chance means for losing said tallying pieces immediately after they are gained.

4,441,719

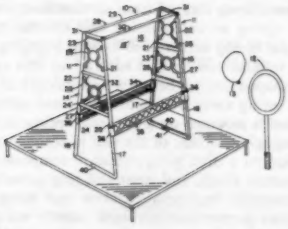
BALLOON GAME

Raymond J. Lohr, 5043 Sterrettania Rd., Erie, Pa. 16506

Continuation-in-part of Ser. No. 23,612, Mar. 26, 1979, abandoned. This application Aug. 31, 1981, Ser. No. 297,703

Int. Cl.³ A63B *63/02*

U.S. Cl. 273—402 **12 Claims**



1. A game comprising, in combination,

a target, said target comprising a first frame member capable of being assembled to enclose a first area,

a second frame member capable of being assembled to enclose a second area,

said first frame member and second frame member being laterally spaced from each other,

said first area and said second area being adapted to permit a balloon to move therethrough,

support members,

said support members being adapted to support said first frame member and said second frame member in said spaced relation to each other,

a balloon,

said balloon being inflated sufficiently to cause it to move relatively slowly through the air and to drop slowly to the ground,

said first frame member, said second frame member and said support members comprising sections,

said sections including a top member, a first bottom member, a second bottom member, a first side member and a second side member,

means adapted to attach said top member to said first and second side members,

means adapted to attach first bottom member to said first and second side member,

means adapted to attach second bottom member to said first and second side member, whereby the sections may be assembled to form said target.

4,441,720

SEAL OF A MILL

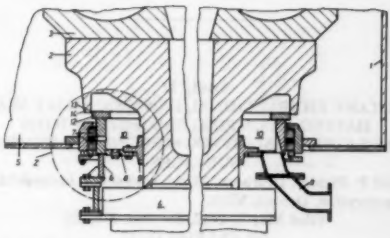
Günter Dibowski, Essen, and Helmut Grommes, Duisburg, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 21, 1982, Ser. No. 435,769

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141830

Int. Cl.³ F16J *15/40*

U.S. Cl. 277—3 **4 Claims**



1. Seal between rotating and stationary parts of a mill, particularly one operated at excess pressure and which is flowed through by air, comprising a barrier air chamber connected through a gap with interior space of the mill; barrier air fed to said chamber having a flow direction which is directed downwardly from above within the gap; said barrier air having a pressure exceeding the pressure of the carrier gas for passing through said gap and into the interior of the mill to prevent thereby passage of the carrier gas together with coal dust toward the outside, said barrier air comprising an amount substantially equivalent to the amount of carrier gas for preventing said barrier air passing through said gap to the mill interior from conveying any coal dust produced in the mill, said barrier air having a downward flow direction within said gap which is from above to below so that the barrier air flows in the direction in which gravity acts on dust particles suspended in the air, passage of the barrier having an effect on the dust particles which is increased by the force of gravity directed as the barrier air flow whereby the seal is substantially improved.

4,441,721

HIGH TEMPERATURE PACKER WITH LOW TEMPERATURE SETTING CAPABILITIES

Allen E. Harris, and David D. Szarka, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 6, 1982, Ser. No. 375,417

Int. Cl.³ F16J *15/06, 15/20, 15/24*

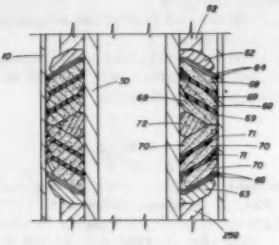
U.S. Cl. 277—26 **19 Claims**

1. In a pack-off device of the type including means to longitudinally compress a packer element associated with said device, a packer element comprising:

at least one low temperature packing segment adapted to maintain shape and substantial resiliency up to a predetermined temperature and to lose shape and resiliency at temperatures thereabove; and

a plurality of high temperature packing segments adapted to

maintain shape and substantial resiliency at temperatures including and above said predetermined temperature, said



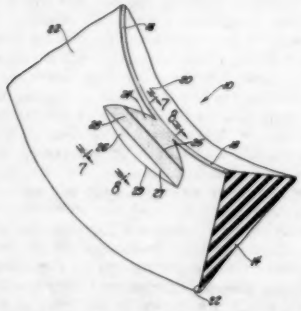
at least one low temperature packing segment being disposed between at least two of said plurality of said high temperature packing segments.

4,441,722

ROTARY BIDIRECTIONAL DYNAMIC SHAFT SEAL HAVING A PUMPING PROJECTION WITH ANGULATED PRIMARY AND SECONDARY PUMPING SURFACES

Gerald P. Pichler, Dearborn, Mich., assignor to Federal-Mogul Corporation, Detroit, Mich.

Filed May 7, 1982, Ser. No. 375,926
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—134 **7 Claims**



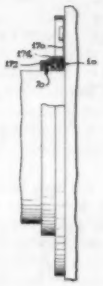
1. A rotary bidirectional dynamic shaft seal (**10**) for sealing between a pair of relatively rotatable members, one of which (**12**) rotates about an axis, and comprising; a radially extending annular sealing edge (**18**) defined by first and second converging frustoconical surfaces (**20, 22**) extending about a common axis; a plurality of hydrodynamic pumping projections (**24, 26, 28**) extending from one (**22**) of said frustoconical surfaces, each said pumping projection having a primary pumping surface (**24**) extending generally axially from said sealing edge (**18**) and radially outwardly from said second frustoconical surface (**22**) and having a return surface (**26**) extending radially outwardly from said second frustoconical surface (**22**) to define the rear extremity of said pumping projection, characterized by each said pumping projection including a secondary pumping surface (**28**) extending axially between said primary pumping surface (**24**) and said return surface (**26**) and radially outwardly from said primary pumping surface at a shallow angle (A) relative to said primary pumping surface (**24**).

4,441,723

DUCT SEAL

Fred A. Greenwald, Battle Ground, Wash., assignor to General Connectors Corp., Burbank, Calif.

Division of Ser. No. 212,028, Dec. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 181,411, Aug. 26, 1980, abandoned. This application Apr. 13, 1982, Ser. No. 367,930
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—164 **2 Claims**



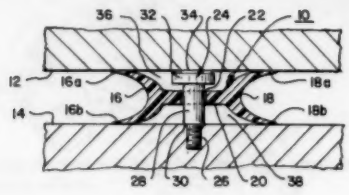
1. An aircraft duct connector to be used with aircraft ducts, comprising a tubular housing, counter bores formed on at least one end of said tubular housing for positioning seal rings in said housing in spaced side-by-side relationship, outer and inner seal rings mounted in the counter bores at at least one end of said tubular housing, means in said housing cooperating with said counter bores to hold said seal rings in said spaced side-by-side relationship, said outer seal ring being solid and generally circular in cross-section and having an inner surface, said inner surface formed from an elastomer impregnated fabric and comprising a work-engaging surface adapted to make a sealing engagement with a surface on a duct, said outer seal ring further including a generally tubular ring-shaped insert engaging the surfce of said fabric opposite said work-engaging surface, said insert being formed from an elastomeric material, a ring-shaped spring mounted inside said tubular ring-shaped insert with the spring surrounded by and engaging the inner walls of the tubular insert and in such a way that at least part of said ring-shaped insert is between said spring and said fabric to hold said spring away from said fabric, said spring sized so when said seal is mounted on a duct said spring maintains the said work-engaging surface of the seal in sealing engagement with a surface on a duct independent of temperature over a wide temperature range, said inner seal ring including a lamination of elastomer impregnated fabric and being generally channel shaped in cross-section with radially outwardly extending legs and a connecting web, the web of said lamination having a work contacting surface and an opposite surface, the radial outer end of one of said legs being spaced from said tubular housing both to prolong seal life and to communicate duct pressure to the interior of the tubular housing between said legs, the work contacting surface of the inner seal ring adapted to be in sealing engagement with a surface of a duct whereby the inner seal ring can withstand high duct pressures while maintaining sealing contact, said inner seal ring including a tubular ring-shaped insert formed from an elastomeric material mounted on the surface of the lamination of said inner seal ring opposite said work contacting surface, a ring-shaped spring mounted inside the tubular insert of the seal ring with said spring engaging the inner walls of the tubular insert so that a thickness of the elastomeric material composing the insert is between the spring and the said opposite surface of the web, said spring sized so as to exert a compressive radially inwardly directed force on the web of said inner seal ring to maintain the work contacting surface of the inner seal ring in sealing engagement with a surface on a duct independent of temperature over a wide temperature range.

4,441,724

FLUID-TIGHT SEAL

Laurence D. Taylor, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Mar. 16, 1981, Ser. No. 244,240
Int. Cl.³ F16J 15/02
U.S. Cl. 277—166 5 Claims



1. Apparatus for forming fluid-tight seal between two confronting surfaces comprising:

a plurality of spaced rigid post members mounted to one of said surfaces and adapted to engage the other of said surfaces when it is brought into said confronting relationship to provide a space between said confronting surfaces;

gasket means longitudinally extending between said confronting surfaces and having a pair of spaced sealing members adapted to engage said confronting surfaces to form seals therebetween; and

deformable web means joining said spaced sealing members and having a plurality of longitudinally spaced openings formed therein,

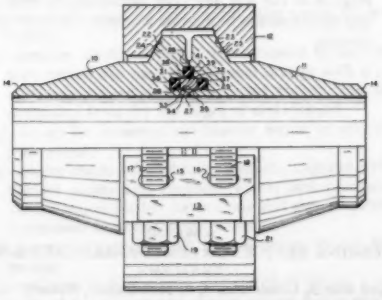
said post members having enlarged head portions adapted to pass through said openings in said web means by deforming said openings and thereby retain said gasket means.

4,441,725

QUAD BOLT

Kent T. Bailey, Houston, Tex., assignor to Thornhill Craver Company, Houston, Tex.

Filed Apr. 9, 1982, Ser. No. 366,914
Int. Cl.³ F16J 15/12; F16L 23/00
U.S. Cl. 277—167.5 2 Claims



1. A coupling comprising,

a pair of confronting hubs,

confronting inner and outer annular grooves in the confronting faces of said pair of hubs,

means for clamping said hubs in end-to-end abutment with at least the faces of the hubs immediately outboard of the outer groove in engagement,

a malleable metal seal ring in said inner groove of each hub sealing between the confronting hub faces,

an O-ring in the bottom of each inner groove sealing between each hub and the metal seal ring, and

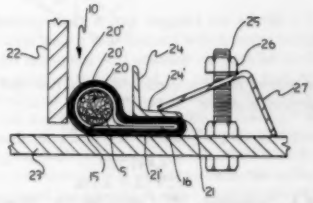
an O-ring in said outer groove sealing against fluid flow in either direction to provide an environmental seal against external fluid under pressure which might corrode the metal seal ring and to seal against internal pressure in the event of failure of the metal seal ring and one of the O-rings in one of said inner grooves.

4,441,726

HEAT AND VIBRATION RESISTANT SEAL

Larry A. Uhl, Sandusky, Ohio, assignor to Shan-Rod, Inc., Huron, Ohio

Filed Dec. 14, 1981, Ser. No. 330,192
Int. Cl.³ F16J 15/16
U.S. Cl. 277—230 7 Claims



1. A heat and vibration resistant seal construction comprising:

a. a core member constructed of a dense, resilient material having spring-like properties at elevated service temperatures;

b. an intermediate wrap member constructed of a fiber material having an alumina-boria-silica composition, said intermediate wrap member forming a co-extensive cover for said core; and

c. an outer wrap member of at least one layer of braided wire metal mesh forming a co-extensive cover around said intermediate wrap member.

4,441,727

LOAD CARRYING APPARATUS

John W. Durcan, 178 Newbrook La., Bay Shore, N.Y. 11706

Division of Ser. No. 139,883, Apr. 14, 1980, Pat. No. 4,312,090.
This application Oct. 13, 1981, Ser. No. 310,385
Int. Cl.³ B62B 11/00; B62D 21/00; B60S 3/06
U.S. Cl. 280—62 8 Claims

1. A load carrying apparatus comprising:

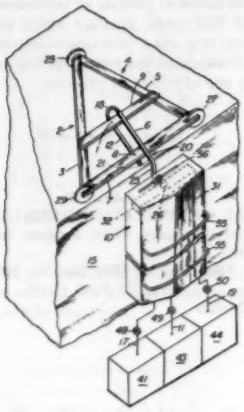
a moveable triangular shaped carriage disposed at an elevation above the load to be conveyed;

a cross-member connected to two sides of said triangular shaped carriage, said two sides being of equal length, and parallel to the third side of said triangular shaped carriage;

a first load carrying member connected to the underside of the midpoint of said cross-member and the underside of the midpoint of said side of said triangular shaped carriage parallel to said cross member, said first load member extending slightly beyond said cross-member;

a second load carrying member have a first segment, parallel to said first load carrying member disposed above said carriage and a second segment, disposed downward from

said carriage, perpendicular to said first segment; in communication with said load;

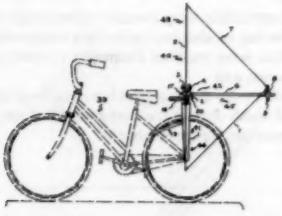


a connecting member connecting said first and second load carrying member.

4,441,728
BICYCLE SAIL

Warren C. Schroeder, 200 Cambridge Dr., Hagerstown, Md. 21740

Filed Aug. 10, 1981, Ser. No. 290,927
Int. Cl.³ B62B *15/00*
U.S. Cl. 280—213 **10 Claims**



1. In a bicycle having a sail, the combination comprising: an apparatus for bicycle (39) having a front wheel and rear wheel, each with an axle, to increase its forward thrust when available winds exist in a desired direction wherein said rear wheel includes a frame, said apparatus comprising; sail support means comprising a U-shaped structure (1) mounted over said rear wheel journaled at the lower ends by bores matching said rear axle, said support means secured by nuts (18) to said rear axle and secured in position by upper braces (19) interconnecting the bicycle frame with said support means, and means on the uppermost surface of said support (1) for mounting a pad (31) secured to a vertical spindle (21), said vertical spindle being concentric with an upper matching spindle having a U-shaped yoke (3), an outer tube (20) journaling both said spindle and U-shaped yoke (3) and said vertical spindle (21), the upper end of said outer tube (20) secured to said spindle and U-shaped yoke (3), the lower end of said outer tube being slotted and clamped to said spindle (21) by a surrounding collar (25), and a grip handle (16) connected to said collar, said U-shaped yoke (3) bored 90 degrees through the radial arc portion (49) of said U-shaped yoke.

4,441,729
FOLDING BICYCLE

Herbert N. Underwood, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 17, 1982, Ser. No. 378,964
Int. Cl.³ B62F *15/00*
U.S. Cl. 280—278 **4 Claims**

1. A folding bicycle assembly, comprising:

a rear subassembly including a hollow cylindrical sprocket hub having first and second annular bearing end portions, an upright tubular support member extending from said sprocket hub, a pair of rear wheel axle supports extending from said sprocket hub at substantially right angles relative to the upright support, and a yoke member, having a first end affixed to said upright support end including a rear wheel axle receiving means at the ends of the rear wheel axle supports, a rear wheel, and a rear wheel axle extending through said rear wheel and fastened to the rear wheel axle receiving means to complete a rigid, generally triangular subassembly, and

a front subassembly, including a fork hub member defining a bore, a pair of fork legs extending downwardly from said hub member terminating in axle retaining means to receive the axle for a front wheel, at least two horizontal support members extending rearwardly from the fork hub member at substantially right angles to the fork legs, and a pair of angular supports extending from the fork hub member at an angle intermediate the horizontal support member and the fork legs, said angular support members defining extremities terminating at annular bearing means which ride on the sprocket hub bearing end portions enabling relative rotation of the rear and front subassemblies to thus nest said subassemblies to provide a compact arrangement for storage.

4,441,730
STEERING DEVICE FOR MANY-AXLED GOOSE-NECK TRAILERS

Sverre Damm, Gamleveien 1, N-1473 Skårer, Norway

PCT No. PCT/NO81/00006, 371 Date Nov. 6, 1981, 102(e) Date Nov. 6, 1981, PCT Pub. No. WO81/02554, PCT Pub. Date Sep. 17, 1981
PCT Filed Mar. 10, 1981, Ser. No. 320,956
Claims priority, application Norway, Mar. 11, 1980, 80/0682
Int. Cl.³ B62D *53/06*
U.S. Cl. 280—426 **5 Claims**

1. Steering device for a multi-axled goose-neck trailer which is coupled with a vehicle in front of said trailer, said steering device comprising wheels pivotable about a main axle and connected to stay rods for forcibly steering said wheels, said

stay rods each connected to an intermediate member, said intermediate member also connected to a double piston rod,

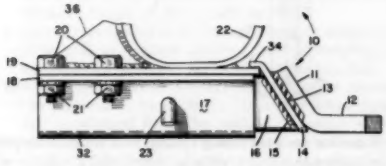
the ends of which are adapted for receiving a hydraulic signal from said vehicle.

4,441,731

TOWING SYSTEM FOR VEHICLES WITH REAR BUMPERS

Jerome Belsky, 44 Strawberry La., Rolling Hills Estates, Calif. 90724, and Don M. Belsky, 5427 Vista Fortuna, Cypress, Calif. 90630

Filed Feb. 8, 1982, Ser. No. 346,861
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—495 **10 Claims**



1. A towing system for vehicles with rear bumpers, comprising:

(a) anchor plate means adapted for securement to the underside of said rear bumper of said vehicle so that the ends of said anchor plate means project forwardly and rearwardly from said bumper;

(b) means for securing said anchor plate means to said rear bumper;

(c) bracket means adapted for securement to said anchor plate means and having a channel therein with a pair of mounting flanges laterally disposed thereto, said flanges projecting from the top edges of said channel;

(d) means for securing said bracket means to said anchor plate means;

(e) tongue means adapted to be slideably engaged with said bracket means and disposed within said channel, said tongue means further having one end thereof projecting rearwardly from said bracket means;

(f) means for securing said tongue means to said bracket means;

(g) end plate and lip means, said end plate having a portion secured to said one end of said tongue means projecting rearwardly from said rear bumper and said lip means having a portion being disposed over said end of said anchor plate means projecting outwardly from said rear bumper in intimate abutting relationship therewith when said tongue means is fully engaged with said bracket means; and a

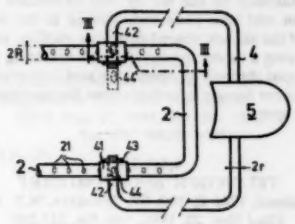
(h) ball hitch mounting means attached to said end plate and lip means, said ball hitch mounting means including a rearwardly projecting tang portion having a hole therein for mounting a ball hitch therein for towing a vehicle.

4,441,732

SKI BINDING WITH A FOOT SUPPORT

Hans Napflin, Kastanienallee 5, Beckenried, Switzerland (CH 6375)

Filed Sep. 10, 1981, Ser. No. 301,028
Claims priority, application Austria, Oct. 27, 1980, 5282/80
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—614 **5 Claims**



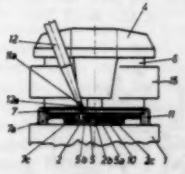
1. Ski binding with a foot support on which a front toe bracket for a ski boot is fastened and which has two rods which at least in the skiing start-off position run parallel to the longitudinal direction of the ski and on which a heel bracket is provided equipped with a swingable heel holder, each bracket at its forward end being equipped with an inwardly bent end, said heel holder and heel bracket clamping the heel of said boot in the skiing start-off position, a number of recesses for adjusting said heel bracket being arranged on each rod in the longitudinal direction of the ski which serve to hold one of the bent ends of the bracket, characterized by the fact, that on each rod (2) a U-shaped shackle (41) is arranged which extends over the rod and through whose sides one of the bent ends (42) of the heel bracket passes while extending under the rod (2), and that the recesses (21) are arranged on the side of the rod (2) facing the upper side of the ski and shaped to conform to said bent ends, and that each bent end (42) of the bracket (4) has a recess (44) which when said heel bracket is in a position deviating angularly from the start-off position can be brought under the respective recess (21) of the rod (2) so that the bent end (42) of the heel bracket (4) is not in engagement with this recess (21) and the bracket (4) can be moved jointly with the two U-shaped shackles (41).

4,441,733

ADJUSTING MECHANISM FOR A SKI BINDING JAW

Engelbert Spitaler, Wr. Neudorf, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Dec. 4, 1981, Ser. No. 327,390
Claims priority, application Austria, Dec. 19, 1980, 6197/80
Int. Cl.³ A63C *9/22*
U.S. Cl. 280—633 **16 Claims**



1. A mechanism for adjusting the position of a ski binding jaw on a ski, comprising a guide rail adapted to be secured to the ski and having laterally spaced guideways which extend longitudinally of the ski, said ski binding jaw being arranged on a base plate and said base plate being supported on said later-

ally spaced guideways of said guide rail for movement longitudinally of the ski, said guide rail having at least one longitudinally extending serrated strip thereon which can releasably engage a tooth system provided on a locking element which is supported for movement transversely of the ski and is biased by a spring, said spring having one end supported on said locking element, said locking element and spring being disposed between said guideways of said guide rail and being secured against movement relative to said base plate in a direction longitudinally of the ski by two extensions which are provided on said base plate and, viewed in the longitudinal direction of the ski, are spaced from one another, said locking element having a recess for receiving an operating tool which can be inserted through an opening in said base plate, and said locking element having a further recess for receiving said one end of said spring.

4,441,734

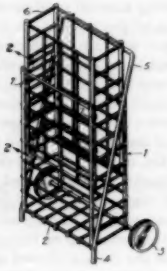
TELESCOPIC SHOPPING CART

Ann R. Schlissel, 1745 E. 18th St., Brooklyn, N.Y. 11229

Filed Nov. 20, 1981, Ser. No. 323,248

Int. Cl.³ B62B *1/12*

U.S. Cl. 280—638 **3 Claims**



1. In a wheeled shopping cart comprising a container member having a frame defining four sides and a bottom, the improvement which comprises an extension member defining four walls and fitting telescopically within said container member and extendible vertically upward in order to variably increase the volume of the container member of the cart; and fastening means engaging the frame of said container member and the extension member in order to hold the extension member in any desired extended position.

4,441,735

STEERING GEAR ASSEMBLY FOR A LAWN AND GARDEN TRACTOR

Wayne R. Hutchison, Mayville, and David L. Apple, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Feb. 18, 1982, Ser. No. 349,796

Int. Cl.³ B62D *7/10*

U.S. Cl. 280—771 **4 Claims**

1. A vehicle steering system, comprising: a support means; a steering input shaft and a steering output shaft each being journalled for oscillation in the support means about respective axes which converge downwardly toward each other; first and second intermeshed straight bevel gears respectively mounted on said input and output shafts for oscillation therewith; said intermeshed straight bevel gears having respective desired operational positions located against said support means; and biasing means acting on at least one of the first and second bevel gears and biasing it to its respective desired operational position.

4,441,736

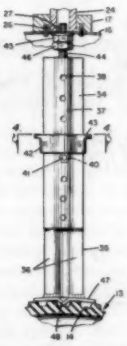
DEVICE FOR REDUCING WEAR IN VEHICLE SUSPENSION SYSTEMS

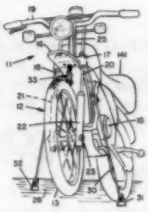
Joel T. Shedden, P.O. Box 628, Lake Elsinore, Calif. 92330

Filed May 12, 1982, Ser. No. 377,350

Int. Cl.³ B60R *27/00*

U.S. Cl. 280—754 **10 Claims**





1. A device for preventing flexing of a resilient suspension system interconnecting a vehicle chassis and a vehicle wheel, said wheel including a tire having a tread thereon, which comprises:

a pair of elongate members adapted to be positioned between a part of said chassis and said wheel,

means for adjustably securing said members together to extend to any one of a choice of overall lengths,

first means at the remote end of one of said members for interlocking engagement with the tread of said tire, and

second means at the remote end of the other of said members for engagement with said part of said chassis.

4,441,737

VEHICLE WITH A PASSIVE BELT SYSTEM

Robert Wimmer, Ebersberg, and Laslo Levai, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

PCT No. PCT/EP81/00047, 371 Date Jan. 4, 1982, 102(e) Date Jan. 4, 1982, PCT Pub. No. WO81/03468, PCT Pub. Date Dec. 10, 1981

PCT Filed May 16, 1981, Ser. No. 336,387

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1980, 8014800[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **3 Claims**

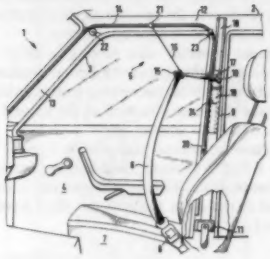
1. A passive safety belt system for a motor vehicle having:

a diagonal safety belt, which is movable along the upper edge of a door opening of a front side door of the vehicle, and is affixed in the generally midplane area of the vehicle to a seat by a locking means;

transport means controlling the movement of the safety belt said transport means are activated by the motions of the side door of the vehicle;

a deflection element contained in a rear door post for adjust-

ing the length of the safety belt to match the shoulder height of the vehicle occupant;
an automatic roller contained in the rear door post;
a carrier slidably carried by the safety belt; wherein:
the safety belt passes over the deflection element onto the automatic roller;
the motions of the side door activate a switch which moves the transport means;
the transport means is carried by the carrier by a cable having a constant length;
the deflection element is slidably carried by a guide, which extends from the shoulder height area beyond the upper end region of the rear door post;



a movable stop means is provided in the guide to lock the safety belt in the guide when adjusting the belt to the shoulder height of the vehicle occupant;
a gripper is provided in the transport means along the rear door post at a given distance from a coupling point between the transport means and the safety belt;
said gripper serves to displace the deflection element in the upper end area of the rear door post when the safety belt is released from the vehicle occupant while the transport means is displaced over a second deflection element, which is solidly fastened to the chassis in the upper end of the front door post.

4,441,738

SEAT BELT TENSIONING DEVICE

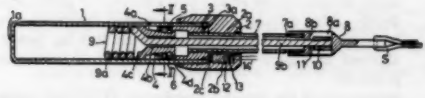
Noboru Tsuge, Kariya; Toshiaki Shimogawa, Okazaki; Satosi Kuwakado, Aichi, and Toshihiro Takei, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 7, 1981, Ser. No. 309,407

Claims priority, application Japan, Dec. 30, 1980, 55-190057[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—806 **11 Claims**



1. A seat belt tensioning device to be mounted on a vehicle, comprising:
a cylinder installable on a vehicle;
a piston slidable in said cylinder and adapted to be connected to the belt for tensioning the latter on movement of said piston in one direction;
means for moving said piston in said one direction at an urgent time, e.g. on an impact of the vehicle;
a first means for connecting said piston to said seat belt, said first means including load-limiting means for disconnecting the seat belt from said piston when a predetermined tension load is applied to said load limiting means;
a second means for connecting said piston to the seat belt when the seat belt is disconnected from said piston by said load limiting means;
means for locking said piston to said cylinder to prevent belt-tensioning movement of said piston when a predetermined tension load is applied to said second connecting means; and
said second connecting means including energy absorbing means elongatable by a predetermined load for absorbing kinetic energy of the passenger restrained by the belt.

4,441,739

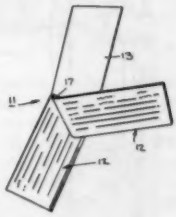
BOOKLET

Warren S. Cluff, 510 Topping Hill Rd., and David W. Cluff, 610 Dorian Rd., both of Westfield, N.J. 07090

Filed Aug. 27, 1981, Ser. No. 296,803

Int. Cl.³ B42D *1/00*

U.S. Cl. 281—16 **9 Claims**



1. A booklet for attachment to a bulk container for prescription drugs, said booklet comprising a spine, a plurality of removable multi-page pamphlets secured at one side to said spine with said pages of each pamphlet being secured together at an opposite side, said pages of each pamphlet being perforated adjacent said one side to permit separation of each pamphlet from the remainder of said pamphlets, at least some of said pamphlets containing identical printed patient information.

4,441,740

CONNECTORS FOR SECURING MEMBERS TOGETHER UNDER LARGE CLAMPING FORCE

William S. Cowan, and Edward M. Galle, Jr., both of Houston, Tex., assignors to Armco Inc., Middletown, Ohio

Filed Dec. 4, 1981, Ser. No. 327,445

Int. Cl.³ F16L *35/00, 55/00*

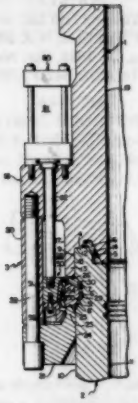
U.S. Cl. 285—18 **13 Claims**

1. In a connector for connecting two members together under a large clamping force, the combination of
a first connector member to be joined to one of the members to be connected;
a second connector member to be joined to the other of the members to be connected;
annular locking means carried by the first connector member and presenting a generally annular locking shoulder capable of flush engagement with a mating shoulder carried by the second connector member,
the locking means being radially distortable between an inactive position, in which the locking means can be moved axially relative to the second connector member, and an active position, in which the locking shoulder is engaged with the mating shoulder,
the locking means being yieldably biased toward its inactive position;
a resilient metal split ring having an inner surface and an outer surface,
one of the inner and outer surfaces of the split ring being shaped and dimensioned for telescopic engagement with the locking means,
the other of the inner and outer surfaces of the split ring

being frustoconical, tapering axially of the connector and constituting a cam follower surface;

a rigid driving ring having a frustoconical camming surface tapering at the same angle and in the same direction as the cam follower surface of the split ring;

the split ring and the driving ring being supported on the first connector body for movement axially of the connector between first positions, in which the locking means is allowed to occupy its inactive position, and second positions, in which, when both the split ring and the driving ring occupy their second positions, the locking shoulder of the locking means is in wedging engagement with the



mating shoulder, the excursion of the driving ring from its first position to its second position being longer than the excursion of the split ring from its first position to its second position;

a plurality of rigid rolling antifriction elements disposed between and in direct rolling engagement with the camming surface of the driving ring and the cam follower surface of the split ring; and

retaining means carried by the split ring and the driving ring and disposed to prevent the antifriction elements from rolling axially beyond the confines of the opposed portions of the camming and cam follower surfaces.

4,441,741

CONNECTORS FOR SECURING MEMBERS TOGETHER UNDER LARGE CLAMPING FORCE

Edward M. Galle, Jr., Houston, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Dec. 4, 1981, Ser. No. 327,446
Int. Cl.³ F16L *35/00, 55/00*
U.S. Cl. 285—18 **18 Claims**

1. In a connector for connecting two members together under a large clamping force, the combination of:

a connector body to be joined to one of the members to be connected and dimensioned to be moved in telescopic relation relative to the other member to be connected;

annular locking means carried by the connector body and presenting a generally annular locking shoulder capable of flush engagement with a mating shoulder carried by the other member to be connected,

the locking means being radially distortable between an inactive position, in which the locking shoulder is spaced radially from the mating shoulder, and an active position, in which the locking shoulder engages the mating shoulder when the connector body is operatively positioned relative to the other of the members to be connected, the locking means being yieldably biased toward its inactive position,

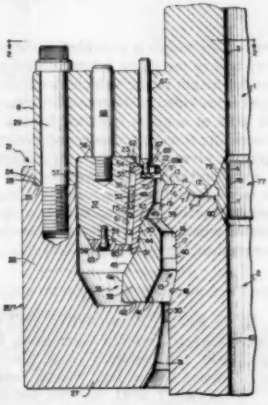
the locking means having a first annular surface which is directed toward the other of the members to be connected and a second annular surface directed away from the other member to be connected, the second annular surface of the locking means having a first frustoconical surface;

first actuating means carried by the connector body and comprising a resiliently expansible and contractible annular member dimensioned for telescopic engagement with the second annular surface of the locking means and having

a second frustoconical surface constituting a camming surface which tapers in the same direction and at the same angle as the first frustoconical surface and is disposed to engage the first frustoconical surface in camming relation as the annular member is moved telescopically relative to the locking means,

the annular member also having a third frustoconical surface constituting a cam follower surface which faces radially away from the second frustoconical surface and tapers in the same direction as the second frustoconical surface but at a smaller angle;

second actuating means comprising a rigid driving ring having a fourth frustoconical surface facing toward the third frustoconical surface and tapering in the same direction and at the same angle as the third frustoconical surface; and



a plurality of rigid rolling antifriction elements disposed between and in direct rolling engagement with the third and fourth frustoconical surfaces;

the annular member of the first actuating means being disposed for movement axially of the connector and independently of the driving ring of the second actuating means between a first position, in which the locking means is allowed to assume its inactive position, and a second position,

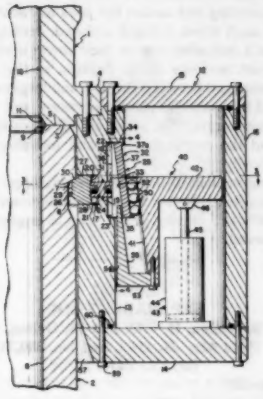
movement of the annular member to its second position causing the first and second frustoconical surfaces to coact to displace the locking means through most of the excursion of the locking means from its inactive position to its active position;

the driving ring of the second actuating means being disposed for movement axially of the connector between a first inactive position and a second fully actuated position, movement of the driving ring from its first position to its second position causing the third and fourth frustoconical surfaces and the rolling antifriction elements to coact to radially distort the annular member of the first actuating means and drive the locking means through the remaining portion of its excursion to bring the locking shoulder into final engagement with the mating shoulder.

4,441,742
CONNECTORS FOR SECURING MEMBERS TOGETHER UNDER LARGE CLAMPING

James H. Owens, III, Houston, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Dec. 4, 1981, Ser. No. 327,449
Int. Cl.³ F16L 35/00, 55/00
U.S. Cl. 285—18 15 Claims



1. In a connector for securing two members together under a large clamping force, the combination of

a connector body adapted to be secured rigidly to one of the members;

generally annular locking means having

a frustoconical locking shoulder, and

an annular cam follower surface concentric with the axis of the connector body and tapering axially with respect to the connector body,

the locking means being supported on the connector body for radial movement between an inactive position, in which the diameter of the locking means allows the connector body to be moved axially relative to the other member to be secured so as to place the locking means in operative position relative to the other member, and an active position, in which the diameter of the locking means is such that said locking shoulder will engage coacting locking means on the other member to be secured;

a driving ring having a generally annular axially tapering camming surface parallel to said cam follower surface and concentric therewith, said camming surface and cam follower surface being spaced apart radially;

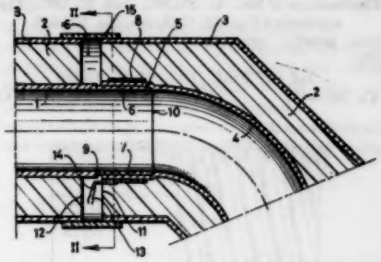
a plurality of rigid rolling antifriction elements disposed and retained between said camming surface and cam follower surface and engaged therewith; and

means carried by the connector body and supporting the driving ring for axial movement between a first position, in which the camming ring allows the locking means to occupy said inactive position, and a second position, in which the locking means is forced by coaction of said camming surface, said rolling antifriction elements and said cam follower surface to occupy said active position.

4,441,743
ADHESIVELY JOINED PIPE CONNECTION

Johannes F. Steenbergen, Ommen, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Sep. 14, 1981, Ser. No. 301,643
Claims priority, application Netherlands, Sep. 15, 1980, 8005161
Int. Cl.³ F16L 47/02, 55/00, 59/16
U.S. Cl. 285—21 7 Claims

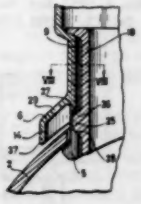


1. A plastic pipe connection, comprising a female pipe part and male pipe part, of fibre reinforced thermosetting plastics, secured together by means of a thermosetting adhesive, at least said female part (4) having a thermally insulating foam plastic layer (2) on its male-part receiving portion (5), characterized in that an electrically heatable foil element (8) covered by the insulating layer (2) is provided on the outer wall surface of the receiving portion (5).

4,441,744
BRANCH PIPE PART

Albertus A. Oostenbrink, Hardenberg; Anno G. Negen, Ommen, and Marinus L. G. van Kaam, Leimuiden, all of Netherlands, assignors to Wavin B.V., Zivolle, Netherlands

Filed Dec. 17, 1981, Ser. No. 331,577
Claims priority, application Netherlands, Dec. 18, 1980, 8006882
Int. Cl.³ F16L 41/00, 55/00, 21/00
U.S. Cl. 285—162 6 Claims



1. A plastic branch pipe part for connecting a discharge conduit to a main conduit, the lower end of said branch pipe part to be inserted into an opening of a main conduit comprising a first outwardly extending projection part forming with the outer side of the branch pipe an annular space for receiving an annular sealing member, the lower portion (11) of said branch pipe part being provided with lock means (5) to be inserted and locked into a main conduit (2) and having an incision (10) to allow said portion to be deformable and being provided with a positioning member (9) in the form of a groove, a bush (19) having a positioning member portion (25) in the form of a cam slidably installed in said groove in said lower portion of said branch pipe part (1) and hooking behind an end edge (27) of said incision (10), said cam being guided in said groove (9) of the branch pipe part, said bush obviating any

deformation of the lower part 11 of the branch pipe part to be inserted into a main conduit.

4,441,745

COUPLING PIPE PART FOR INTERCONNECTING CORRUGATED PIPE PARTS

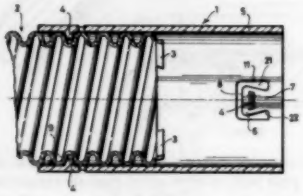
Terry G. Nicholas, Twyford, England, assignor to Wavin B.V., Zwolle, Netherlands

Continuation of Ser. No. 293,952, Aug. 18, 1981. This application Sep. 20, 1983, Ser. No. 533,632

Claims priority, application Netherlands, Aug. 22, 1980, 8004770

Int. Cl.³ F16L *21/00, 15/00, 39/00*

U.S. Cl. 285—417 **6 Claims**



1. Pipe connection for corrugated pipes comprising a coupling pipe part slid over the outer side of corrugated pipe parts said coupling pipe part comprising at least one coupling element located at a distance from the end of the pipe part having a cam (4) directed towards the inside of the coupling pipe part, said coupling element comprising a resilient lip (6) carrying said cam and formed in the coupling pipe part (1) by wall slits (11) characterized in that the lip extends axially of the pipe part and the part of said lip (6) provided with said inwardly directed cam has a larger width than the width of the transition area (7) between the lip (6) and the pipe wall (5) of the coupling pipe part (1), said cam (4) being located at a distance from said transition area.

4,441,746

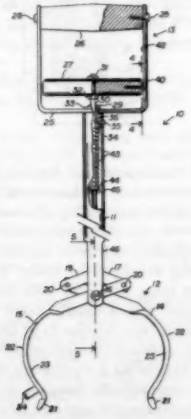
TOOL FOR RETRIEVING OUT-OF-REACH OBJECTS

Edward D. Corboy, Jr., 710 N. Lake Shore Dr., Apt. 606, Chicago, Ill. 60611

Filed Jan. 4, 1982, Ser. No. 336,688

Int. Cl.³ B25B *5/04*

U.S. Cl. 294—19 R **9 Claims**



1. A tool for retrieving out-of-reach objects, comprising:

an elongated, rigid tube having a slot in its lower end, forming a clevis;

a handle assembly and means securing it to the upper end of the tube, including a fixed handle piece engageable by the palm of a user and a movable handle piece engageable by the fingers of the user, movable toward the fixed handle piece;

a connecting rod within the elongated tube, connected at its upper end to the movable handle piece;

a jaw assembly connected at the lower end of the elongated tube, including a pair of movable jaws and means connecting the jaws to the lower end of the connecting rod such that upward movement of the movable handle piece and the connecting rod causes the jaws to converge centrally toward each other, toward a closed, central position, the jaws each including tips at their lower ends and curved, bowed-out portions above the tips, so that small objects can be engaged between the tips, and larger objects can be engaged between the curved portions; and

spring means urging the jaws toward a normal, open position, and the connecting rod and movable handle piece downwardly;

whereby movement of the movable handle piece toward the fixed handle piece, by squeezing movement of the user's hand, effects a closing of the jaws to engage an object to be retrieved.

4,441,747

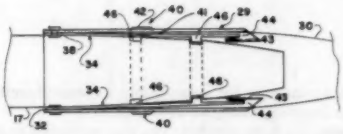
SEPARABLE TOOL

Clayton W. Bryington, II, P.O. Box 78, Gaines, Pa. 16921

Filed May 21, 1982, Ser. No. 380,718

Int. Cl.³ F41C *27/04*

U.S. Cl. 294—51 **7 Claims**



1. A separable tool including a handle portion, a working portion and a connector portion; said handle portion including an elongated member, said elongated member including a gripping section adjacent one end of said elongated member and a male connecting section adjacent the opposite end of said elongated member, said male section including a plurality of annular recesses along the length thereof, said male section including a tapered end section; said working portion including a plurality of tool members with different configurations and the same connector portion configuration, each of said tool members being interchangeably connectable with said male connecting section of said handle portion; said connector portion including a socket section extending from one end of said tool member, said socket section having a diameter slightly larger than said male section of said handle portion, said socket section including a pair of opposed longitudinal slots along the length thereof, strips sections disposed within said socket section, said strip sections being aligned longitudinally of said socket section, one of said strip sections being disposed adjacent each of said longitudinal slots and generally aligned therewith, said strip sections extending beyond the ends of said longitudinal slots, one end of each strip section being affixed to said socket section adjacent to the open end of said socket section, a button member slidably contacting each strip section, said button member including a base section adjacent said strip section and a finger-contacting section extending outwardly through the adjacent longitudinal slot, biasing means disposed in contact with each of said strip sections, each biasing means being located adjacent the end of said strip section remote from said socket section, said biasing means urging said

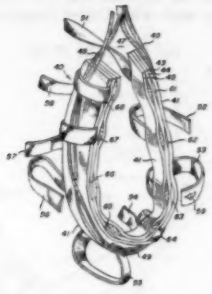
strip section toward said longitudinal slot, protrusions affixed to each strip section along the length thereof, said protrusions extending from said strip section on the side thereof remote from said socket section, said protrusions being spaced longitudinally along the length of said strip section with the same spacing as the spacing between said recesses of said male handle section for engagement therewith.

4,441,748

STRIP THIMBLE

Dennis St. Germain, 19 Stonecrop Rd., Wilmington, Del. 19801

Filed Apr. 12, 1982, Ser. No. 367,391
Int. Cl.³ B66C *1/12*
U.S. Cl. 294—74 **7 Claims**



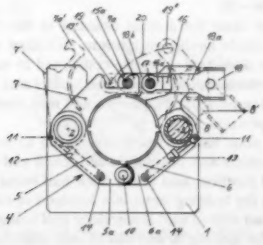
1. Protection means for attachment to a hoisting sling comprising a strip made up of at least three bonded plies of woven webbing of uniform width, a plurality of spaced channels between a first and a second ply of said strip, and a plurality of friction straps secured between said second and a third ply of said strip and extending perpendicularly from a longitudinal edge of said strip, each of said straps corresponding to one of said plurality of spaced channels and having a cross-sectional dimension substantially identical to, or only slightly smaller than, the width of the corresponding channel.

4,441,749

ELEVATOR FOR CASING

Kurt Blaschke, Saarbrücken-Dudweiler, and Josef Roob, St. Wendel, both of Fed. Rep. of Germany, assignors to Stahl- und Apparatebau Hans Leffer GmbH, Saarbruecken-Dudweiler, Fed. Rep. of Germany

Filed Aug. 11, 1981, Ser. No. 291,943
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3031027
Int. Cl.³ B66C *1/42*; E21B *19/02*
U.S. Cl. 294—88 **7 Claims**



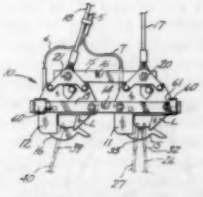
1. An elevator for gripping casings, comprising:
first and second pivotably supported elevator links;
means for producing independent powered pivot movements of said first and second elevator links between an open position in which said links are spaced from one another to form an opening in a side of said elevator to receive a casing laterally into said elevator, and a closed position for gripping a casing received in said elevator;
a double acting force jack secured to said second elevator link for pivotal movement therewith, said force jack being actuatable to produce rectilinear motion of a portion of said force jack;
a hook;
a locking bolt adapted to engage said hook;
one of said hook and locking bolt being attached to said first elevator link, and the other of said hook and locking bolt being connected to said portion of said force jack for rectilinear movement with said portion;
wherein said force jack supplies all of the tension on said first and second elevator links necessary to grip a casing.

4,441,750

CARGO SLING SYSTEM FOR A HELICOPTER

Dwight E. Reber, Aurora, Oreg., assignor to Columbia Helicopters, Inc., Portland, Oreg.

Filed Sep. 17, 1981, Ser. No. 303,006
Int. Cl.³ B66C *1/38*
U.S. Cl. 294—83 R **10 Claims**



1. A sling system for the aerial transport of cargo below a prime mover and subsequent discharge of system components for attachment to a load, said sling system comprising,
elongate sling means,
a guide to which one end of said sling means is attached, said guide including retainers through which said sling means passes when in a load lifting configuration,
a cargo hook assembly suspended from the prime mover and including independently actuated first and second hook components, the first hook component of the hook assembly securing the remaining end of said sling means in a releasable manner, said first and second hook components of the hook assembly adapted for remote and individual actuation to a release position, and
a tag line extending between said second hook component of the hook assembly and said guide to impart elevation to the guide in an endwise manner subsequent to load discharge, endwise elevation of the guide by the tag line causing the released end of the load biased sling means to be drawn dowardly through the guide mounted retainers and thence out of load engagement whereupon the unloaded sling means and guide are suppported by the tag line and the hook assembly until opening of the second hook component results in dropping of the sling system at a loading site remote from the load discharge site.

4,441,751

COLLAPSIBLE HIGH SPEED EXTENSION FOR MOTOR VEHICLES

William M. Wesley, 21956 N. Hickory Hill Dr., Kildeer, Lake County, Ill.

Filed Nov. 24, 1980, Ser. No. 209,945
Int. Cl.³ B62D 35/00; B60R 19/04, 19/10
U.S. Cl. 296—1 S 38 Claims

1. An extension assembly for selectively altering the aerodynamic shape of a vehicle comprising:

a substantially air-tight outer shell of elastomeric material having a first desired contour when in the relaxed state

an interior structure of flexible material which is substantially non-stretchable and which is coupled to the inside of said outer shell, said inner structure being shaped to define a second desired contour when it is tautened, and

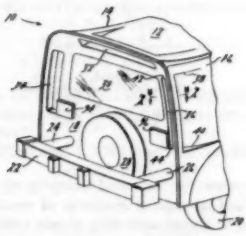
means for selectively introducing a gaseous medium into said outer shell so that the outer shell and inner structure expands from said first desired contour toward said second desired contour.

4,441,752

AUTOMOBILE REAR END CONSTRUCTION

Gordon M. Buehrig, Grosse Pointe Woods, Mich., assignor to Richard P. Kughn, Detroit, Mich.

Filed Jan. 25, 1982, Ser. No. 342,180
Int. Cl.³ B62D 37/02
U.S. Cl. 296—1 S 5 Claims



1. An automotive vehicle body having top and right and left side panels the rearward edges of which intersect with a substantially flat, generally vertical rear end,

said body being provided adjacent the rear end thereof with a plurality of slot means through which air moving rearwardly along said body flows when the vehicle is traveling in a forward direction,

said slot means being disposed inwardly of and elongate in directions substantially parallel to at least certain of said intersecting edges,

each of said slot means having inner and outer walls defining a passageway extending angularly rearwardly and inwardly between an inlet end in one of said panels and an outlet end in said rear end,

the inner walls of said slot means merging at the inlet ends thereof smoothly and relatively gradually with their respective panels to enhance air flow into said slots and merging at the outlet ends thereof relatively abruptly with said rear end, whereby airstreams flowing through said slot means converge in a low pressure air pocket normally created behind said vehicle body in use so as to minimize drag effect on the forward motion of said vehicle caused by said air pocket and the attendant air turbulence behind said body,

the inner walls of at least certain of said slot means being formed with openings therein, and including

light support means secured to said inner walls at said openings, and

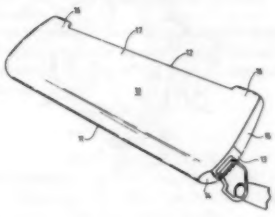
light means disposed on said support means so as to be visible through both the inlet and outlet ends of said certain slot means.

4,441,753

AIRFOILS FOR LAND VEHICLES

Stuart V. Mason, Biggleswade, England, assignor to Paul Forster, Surrey, England

Filed Sep. 28, 1981, Ser. No. 306,476
Claims priority, application United Kingdom, May 11, 1981, 8114365
Int. Cl.³ B60R 27/00
U.S. Cl. 296—1 S 3 Claims



1. An air flow drag reducing member for use with a land vehicle pulling a trailer, said member having an airfoil shaped cross section and a longitudinal axis extending transversely across said vehicle roof, and including means for fixing the ends of said member to the roof of said vehicle, said member further comprising means for adjusting the inclination of said member between a horizontal position, in which said member acts to reduce drag in one of the cases wherein the roof of said trailer is lower than the roof of said vehicle, and wherein no trailer is being pulled, and an inclined position in which said member deflects air over the roof of said trailer.

4,441,754

REAR DOOR FOR ARMORED VEHICLES

Alwin Hantel, Espenau, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Feb. 17, 1982, Ser. No. 349,578
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 3106117
Int. Cl.³ B62D 25/00
U.S. Cl. 296—51 6 Claims

1. A rear door for a door opening in the rear wall of an armored vehicle having an interior, including in combination:

an upper door half pivotally connected to said rear wall of said vehicle and adapted to be locked and made tight in a closed position, and to be pivoted into, and arrested in, an open position;

a lower door half pivotally connected to said rear wall of said vehicle and adapted to be locked and made tight in a closed position, said lower door half being provided with means for holding same in a lowered open position, with the inner side of said lower door half being provided with steps for getting in and out of said vehicle;

a lower edge portion of said upper door half covering an upper edge portion of said lower door half for holding said lower door half in said closed position;

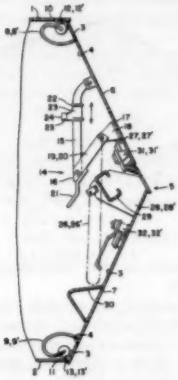
bearing housings respectively rigidly arranged on the inner

side of said rear vehicle wall to the side of and respectively above and below said door opening;

a shaft for each door half, each shaft extending in the transverse direction of said vehicle and being supported in associated ones of said bearing housings; each shaft comprising a rotating rod and serving to aid in pivotal movement of said door halves;

swivel levers respectively fastened to the inner sides of said door halves and to said shafts for effecting pivotal mounting of each door half to an associated shaft; and

a swivel device for effecting movement of said upper door half and for effecting arresting thereof in said open position; said swivel device including a push-pull rod pivotally connected to the inner side of said upper door half, and a lever pivotally connected to said push-pull rod and to the inner side of said rear wall of said vehicle, with said lever being provided with a rigid handle whereby said upper door half is actuated from the vehicle interior with only one hand being needed to actuate door opening movement of both said upper and lower door halves since only the upper door half needs to be open so far until said covering is eliminated with respect to the lower door half because of position of center of gravity automatically to pivot downwardly from closure position thereof.

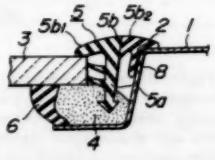


4,441,755

WINDOW MOLDING FOR AUTOMOBILE

Toshiaki Endo, Chigasaki, and Kazuhiko Yoshiyuki, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 210,610, Nov. 26, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,598
Claims priority, application Japan, Nov. 28, 1979, 54-154773
Int. Cl.³ B60J *1/20*
U.S. Cl. 296—93 **1 Claim**



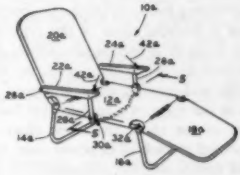
1. In combination, a flexible window molding of resin material, and a peripheral wall of a window opening of a vehicle body, said window molding including a head portion for covering a clearance between an edge of a window glass and said wall, said head portion having a leg portion extending therefrom into said clearance in spaced relation to said window glass edge and the peripheral wall of said window opening with the end of said leg portion being embedded in an adhesive for fixing a peripheral edge of the window glass to a flange of said wall, said head portion having a depending lip arranged in spaced parallel relation to said leg portion and adjacent to said peripheral wall of said window opening, an adhesive interposed between said lip and said peripheral wall, said lip terminating in a ridge for engaging said peripheral wall to retain said adhesive, said window molding being composed of two integral portions of different resin materials, a first, compressive portion adjacent said window glass and a second, stretch portion adjacent said wall of a resin material softer than that of said first portion, thereby snugly fitting the window molding to panels of the vehicle body to obtain a more aesthetical appearance.

4,441,756

LOUNGE CHAIR WITH IMPROVED ARM RESTS

Tony Liou, Tai Pei, Taiwan, and Richard Wang, Fair Lawn, N.J., assignors to Collins Company, Ltd., Secaucus, N.J.

Filed Jan. 29, 1982, Ser. No. 344,170
Int. Cl.³ A47C *4/00, 5/10*; F16B *12/40*
U.S. Cl. 297—39 **1 Claim**



1. In a lounge chair of the type having a horizontally oriented seat and a back rest pivotally connected thereto so as to assume a selected back-supporting angular orientation to said seat and including arm rests in operative arm-supporting positions on opposite cylindrically-shaped sides of said seat, an improved means for mounting each said arm rest in said operative position thereof comprising an arm rest support member pivotally connected to a cylindrically-shaped side of said seat in supporting relation beneath the front of a cooperating arm rest, said arm rest being further connected at its opposite end to said backrest so as to be mounted in spanning relation between said back rest and arm rest support member and to operatively be arranged to partake of movement in unison with the pivotal traversing movement during the positioning of said back rest, a member having on one side a smooth circular contact surface and on an opposite side a semi-circular groove and a depending projection therefrom, said member being stationarily connected in an interposed position between said arm rest support member and said cylindrically-shaped side of said seat with said one side presenting a circular contacted surface for said arm rest support member in any assumed position of pivotal traversing movement thereof, whereby said contact by said arm rest support member against said surface is along a diametrical line of a sufficient extent that is effective to obviate any wobble in said pivotally mounted arm rest support member, and with said opposite side presenting said semi-circular groove for the seating thereof of said cylindrically-shaped side of said seat, to thereby obviate any possibility of rotative movement of said member in relation to said side of said seat that otherwise might result from pivotal movement of said arm rest support member against said opposite contacted surface of said member, and a bar-like member connected in spanning relation between said depending projections of said members to obviate any rotation between said depending projections of said members to obviate any rotation in said members about the longitudinal axis of said cylindrically-shaped sides of said seat.

4,441,757

STRUCTURAL JOINT FOR FOLDING CHAIR

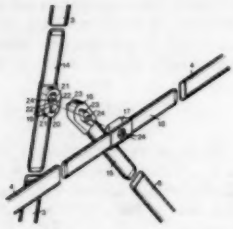
Jesus Gasca Burges, Avda. Madrid, 8 - 90 D, San Sebastian, Spain

Filed Feb. 3, 1981, Ser. No. 231,574

Claims priority, application Spain, Feb. 13, 1980, 248.575[U]; Jan. 22, 1981, 255.730[U]

Int. Cl.³ A47C *4/00*

U.S. Cl. 297—55 2 Claims



1. A structural joint device for use in connecting and enabling relative folding and unfolding movement between tubular elements of a foldable chair of the type including a first element in the form of a rectangular frame and forming the front legs and backrest of the chair, a second element having a U-shaped profile and forming the rear legs of the chair, and a third element in the form of a rectangular frame and forming the seat frame of the chair, the three chair elements being foldably connected at each of opposite sides thereof by a said structural joint device which comprises:

a first elongated flat body having opposite end portions adapted to plug into confronting portions of a lateral member of the first tubular chair element and a central portion having a thickness greater than said opposite end portions;

a second elongated flat body identical in construction to said first flat body and having opposite end portions adapted to plug into confronting portions of a lateral member of the third tubular chair element and a central portion having a thickness greater than said opposite end portions;

each said central portion of said first and second flat members having a surface having therein a recess defined by diametrically opposite curved surfaces, opposite ends of which are joined by pairs of converging planar surfaces which are disposed generally in diametral opposition;

a third elongated flat body having a first end portion adapted to plug into an end of a lateral member of the second tubular chair element and a second end portion having a thickness greater than said first end portion, said second end portion having opposite side surfaces;

each said side surface of said second end portion of said third flat body having extending outwardly therefrom a projection having a rombic contour with rounded smaller corners;

said first, second and third flat bodies being assembled with said second end of said third flat body positioned between said central portions of said first and second flat bodies, with said recesses in said central portions of said first and second bodies facing each other, and with said projections on said opposite side surfaces of said second end portion of said third flat body extending into respective said recesses; and

a pin extending through holes in said central portions, at positions symmetrical with said recesses, and in said second end portion, at a position symmetrical with said projections, said pin defining an axis of relative rotation between said first, second and third flat bodies.

4,441,758

ADJUSTABLE FOOT SUPPORT

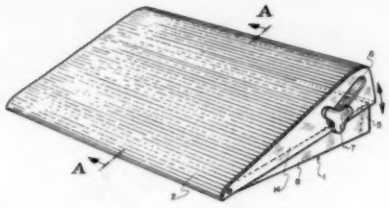
Willy Fleischer, Essen-Werden, Fed. Rep. of Germany, and Alfred von Schuckmann, Kevenhonk 63, 4178 Kevelaer 2, Fed. Rep. of Germany, assignors to Willy Fleischer Metalwarenfabrik GmbH & Co. KG and Alfred von Schuckmann, both of, Fed. Rep. of Germany

Filed Jul. 29, 1981, Ser. No. 288,177

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 8021146[U]

Int. Cl.³ A47C *9/12*

U.S. Cl. 297—439 10 Claims



1. An adjustable footrest comprising;

a floor stand;

a footplate pivotally mounted to said floor stand for height and inclination adjustment thereof;

a trackway defined on said footplate;

an actuating shaft movably mounted along said trackway;

a rack defined on said floorplate and extending at an angle to said trackway to which said shaft is engaged for movement therealong with simultaneous movement of said shaft along said trackway; and

operating means connected to said shaft for moving said shaft simultaneously along said rack.

4,441,759

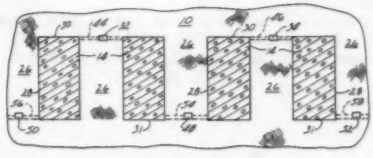
IN SITU OIL SHALE RETORT SYSTEM

Ned M. Hutchins; Irving G. Studebaker, both of Grand Junction, Colo.; Rudolf Kvapil, Tucson, Ariz., and Thomas E. Ricketts, Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Oct. 29, 1981, Ser. No. 316,351

Int. Cl.³ E21B *43/247;* E21C *41/10*

U.S. Cl. 299—2 24 Claims



1. A system of in situ oil shale retorts formed within a subterranean formation containing oil shale, such an in situ oil shale retort having upper, lower, and side boundaries of unfragmented formation and containing a fragmented permeable mass of formation particles containing oil shale, the retort system comprising:

a plurality of mutually spaced apart rows of such in situ oil shale retorts;

load-bearing barrier pillars of unfragmented formation separating adjacent rows of such in situ retorts from one another, such load-bearing barrier pillars being sufficiently strong for preventing substantial subsidence of overburden at eleva-

tions above the upper boundaries of such in situ oil shale retorts;

separate air level drifts excavated in alternating barrier pillars and extending along the length of such pillars between adjacent rows of such retorts adjacent upper edges of the retorts in such adjacent rows;

separate production level drifts excavated along the length of intervening barrier pillars between the barrier pillars in which the air level drifts are excavated, the production level drifts being between adjacent rows of retorts and extending adjacent lower edges of the retorts in such adjacent rows, said lower edges being on opposite sides of such retorts from the sides adjacent the air level drifts;

means for providing fluid communication between such an air level drift and adjacent upper edges of retorts in the rows of retorts adjacent such air level drift; and

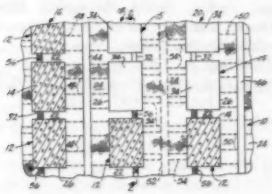
means for providing fluid communication between such a production level drift and adjacent lower edge of retorts in the rows of retorts adjacent such production level drift.

4,441,760

METHOD FOR CLOSING A DRIFT BETWEEN ADJACENT IN SITU OIL SHALE RETORTS

Alex E. Hines, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jan. 4, 1982, Ser. No. 336,914
Int. Cl.³ E21B *43/243*
U.S. Cl. 299—2 **35 Claims**



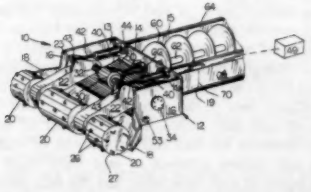
24. A method for inhibiting gas flow through a drift interconnecting first and second in situ oil shale retorts in a subterranean formation containing oil shale, each of said retorts containing a fragmented permeable mass of formation particles containing oil shale, the drift extending through unfragmented formation between the fragmented masses in the first and second retorts, the method comprising filling the drift between the retorts by pneumatically compacting crushed formation particles into the drift, the formation particles having a void fraction smaller than the average void fraction of the fragmented masses in the retorts.

4,441,761

MINING MACHINE

Rush F. Fields, Box 83, Gilbert, W. Va. 25621, and Buddy D. Fields, 6225 Highland Dr., Huntington, W. Va. 25705

Filed Jan. 19, 1982, Ser. No. 340,804
Int. Cl.³ E01C *27/24, 29/22*
U.S. Cl. 299—64 **24 Claims**



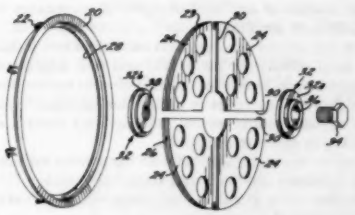
21. A mining apparatus adapted to be connected to a sectioned powered auger conveyor assembly and driven thereby comprising a housing comprising a cutting section and an attachment section, a drive shaft rotatably mounted to said cutting housing section, transmission means mounted to said drive shaft and including an input shaft connected to said transmission means and extending from said cutting housing section into said attachment section; coupling means mounted on the end of said input shaft, said coupling means being adapted to couple said input shaft with the central shaft of said auger conveyor so that said auger conveyor shaft will turn said input shaft and drive said drive shaft through said transmission means, cutting arms rotatably mounted on said drive shaft, cylinder means mounted to said cutting housing section and connected to said cutting arms adapted to selectively rotate said cutting arms around said drive shaft, said cylinder means having fluid lines connected thereto which run along said housing and said auger conveyor structure back to a fluid reservoir remotely located from said cylinder means, means to selectively supply fluid to said cylinder means, a cutter drum axle mounted to said cutting arms, a plurality of cutter drum members mounted on said axle and adapted to be driven by drive means connecting said cutting drum axle with said drive shaft, each of said cutter drum members being provided with cutter means adapted to cut into material such as coal, ore or the like and shear such material from its respective seam or deposit, and conveyor means extending from said cutting housing section into said transfer section, said conveyor means comprising an endless belt and being driven by said drive shaft so that material fragments cut from the seam or deposit are carried onto said conveyor belt and transported along said conveyor belt into the auger conveyor which carries the material back through the auger conveyor back to the desired site.

4,441,762

DECORATIVE WHEEL COVERING FOR PROVIDING A MULTIPLICITY OF DESIGNS

William J. Segal, Culver City, Calif., assignor to Orion Industries, Inc., Compton, Calif.

Filed Apr. 12, 1982, Ser. No. 367,420
Int. Cl.³ B60B *7/04*
U.S. Cl. 301—37 R **10 Claims**



1. A decorative cover for an automotive wheel comprising:

a rim including means for engaging said wheel;

a plurality of decorative segments selectively disposable relative to said rim, whereby disposition of said plurality of segments with respect to each other and to said rim may be arbitrarily varied to create a multiplicity of decorative patterns, with each of said plurality of segments being reversible with respect to said rim and with respect to each other whereby said multiplicity of patterns may be multiplied by both arbitrary disposition of said plurality of segments with respect to said rim and with respect to each other as well as arbitrary reversal of said segments with respect to said rim and with respect to each other;

a center element coaxial with said rim;

first coupling means on the radial outer edge of said segments that are releasably engaged with complementary radially extending coupling means formed on the inner circumferential edge of said rim; and

second coupling means on the radial inner edge of said segments releasably engaged with complementary radially extending coupling means formed on the outer circumferential edge of said center element, said coupling means comprises a tab and groove arrangement.

4,441,763

VARIABLE LOAD CONTROLLED FLUID BRAKE PRESSURE REGULATOR

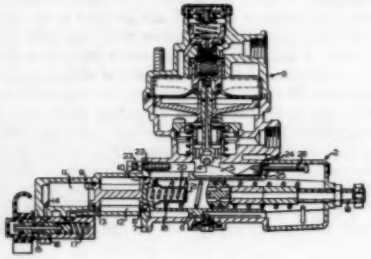
Gerhard Fauck, Hanover, and Bernd-Joachim Kiel, Wunstorf, both of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,936

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105874

Int. Cl.³ B60T *8/20*

U.S. Cl. 303—23 R **6 Claims**



1. A vehicle load controlled fluid brake pressure regulator comprising:

(a) load-dependent variable relay valve means for controlling the vehicle brake pressure;

(b) a control piston subject to a control pressure that varies in accordance with the vehicle load;

(c) a control spring acting on said control piston in a direction counter to said control pressure, thereby establishing an axial position of said control piston in accordance with the vehicle load condition;

(d) first and second cam members carried on said piston means for axial movement therewith, said first and second cam members each having an inclined control surface forming a cam profile that varies in a direction perpendicular to the axis of said control piston, said inclined control surfaces running in opposite directions;

(e) actuator means engageable with the control surface of said cam members and with said relay valve means for setting said relay valve means in accordance with the axial position of said control piston; and

(f) means for axially adjusting one of said cam members relative to the other to thereby set the low point of said cam profile in accordance with the desired "empty" load braking pressure setting of said relay valve means.

4,441,764

RELAY VALVE ASSEMBLY

Ronald O. Newton, Adams, N.Y., assignor to General Signal, Stamford, Conn.

Continuation of Ser. No. 224,932, Jan. 14, 1981. This application May 31, 1983, Ser. No. 499,449

Int. Cl.³ B60T *15/02*

U.S. Cl. 303—40 **7 Claims**

1. A fluid brake control system comprising:

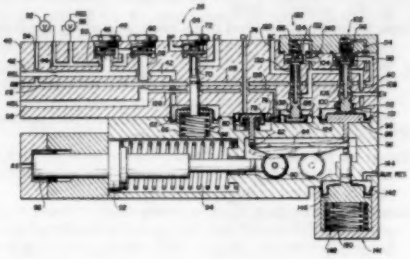
a brake control pipe for transmitting a braking signal;

a first fluid source;

control valve means responsive to braking signal changes of pressure in said brake control pipe to provide control signals from said first fluid source;

supply line having fluid under pressure distinct from said brake control pipe;

relay valve means connected to said brake control pipe, said control valve means and said supply line, responsive to



said control signal for governing the flow of fluid from said supply line to a brake cylinder and responsive to a supply line pressure below a predetermined pressure for creating an emergency brake pressure change in said brake control pipe.

4,441,765

TRACK GUIDE BEARING

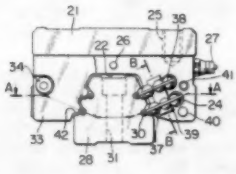
Shinichi Kasai, Fujimi; Sotoji Nakagawa, Machashi, and Nobuyuki Osawa, Takasaki, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 431,701

Claims priority, application Japan, May 7, 1982, 57-65665[U]

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **1 Claim**



1. A track guide bearing provided with a slide table having two parallel axial ball rolling grooves of Gothic arch-like cross section provided in each of the inclined side surfaces of an outwardly opening trapezoidal groove and having axial through-bores providing ball passageways formed rearwardly of said ball rolling grooves, an elongate track shaft having Gothic arch-like ball rolling grooves formed axially thereof and corresponding to the ball rolling grooves of said slide table, each of said Gothic arch-like ball rolling grooves having a narrow escape groove provided in the bottom thereof, side plates fixed to the opposite ends of said slide table and having semicircular ball passageways extending astride of the ball rolling grooves of said slide table and the through-bores corresponding thereto, each of said semicircular ball passageways having a narrow concave groove in the bottom thereof and having formed as a recess, a retainer comprising a wire rod having a straight portion and semicircularly bent portions extending from the opposite ends of said straight portion, said semicircularly bent portions being engaged with the concave grooves of said side plates, and a number of rollable balls disposed between the ball rolling grooves of said slide table and the ball rolling grooves of said track shaft and in the through-bores of said slide table and the ball passageways of said side plates, said balls being selected so as to be capable of fitting in four-point contact condition between the ball rolling grooves of said slide table and the ball rolling grooves of said

track shaft opposed thereto, said slide table being supported on said track shaft by four rows of balls which are in four-point contact, said slide table being axially movable through the rolling movement of said balls.

4,441,766

PROTECTIVE EQUIPMENT CABINET

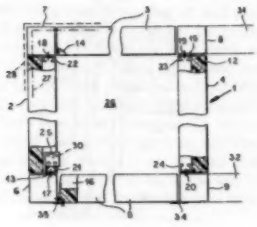
Joachim Hess, Schröplerstrasse 37, D-8070 Ingolstadt, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,441

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1981, 3135471

Int. Cl.³ A47B *81/00*

U.S. Cl. 312—214 **8 Claims**



1. A protective cabinet comprising:

a plurality of upright and hollow square-section posts formed of a rigid synthetic resin and spaced at corners of a polygon;

respective upright walls between the posts and each having

a rigid and rectangular inner panel,

a rigid outer panel generally identical and parallel to the inner panel, the panels having parallel and spaced outer edges,

an annular rim joining the outer edges together and projecting annularly inward past the inner panel, the rim engaging at its outer face at each corner between two respective posts, the panels being formed with respective upturned edges, the upturned edge of the sheet forming the outer panel being taller and forming the rim with the upturned edge of the other sheet, and

a mass of insulating material between the panels and within the rim;

respective rigid equipment-supporting channels at the posts and each lying inward of the respective inner panel against the rim on its inner face; and

fasteners securing the channels through the rims to the respective posts, thereby also securing the respective wall to the respective posts.

4,441,767

CABINET DRAWER ANTI-TIP LOCK DEVICE

Forest G. Stark, Jamestown, N.Y., assignor to AVM Corporation, Jamestown, N.Y.

Filed Apr. 21, 1982, Ser. No. 370,374

Int. Cl.³ A47B *88/00*; E05C *7/06*

U.S. Cl. 312—216 **18 Claims**

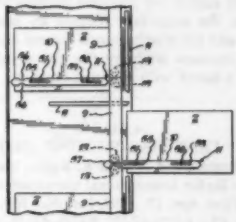
1. An improved cabinet of the type having a case with a plurality of horizontally movable components mounted therein, the improvement characterized by an anti-tip mechanism for preventing more than one component from being opened to its fully extended position at one time, said anti-tip mechanism comprising:

a segmented lock bar extending adjacent each of said components, said lock bar comprising a plurality of longitudinally extending snubber elements axially aligned in end-to-end abutment;

a single abutment element on only one of said snubber elements and a single abutment element on said case in vertical alignment with said first mentioned abutment element;

a single resilient means for urging said abutment elements into engagement to limit vertical movement of said one snubber element whereby all of said snubber elements are maintained in a central equilibrium position and are movable therefrom in opposite directions to first and second opposite axially displaced positions;

a plurality of longitudinally extending activator rails each disposed substantially normal to said lock bar, each rail being carried by a different one of said components, each rail being disposed with one of its ends positioned to



insinuate itself between adjacent snubber elements when its respective component is opened and so shaped with respect to said adjacent snubber elements to displace all of the snubber elements from their central equilibrium positions to one of said first and second positions with the snubber elements located in one of said directions with respect to said insinuated rail moving to said first axially displaced position and those located in the opposite of said one direction moving to said second axially displaced position, whereby the remainder of said plurality of rails and their respective components are blocked by a displaced snubber element.

4,441,768

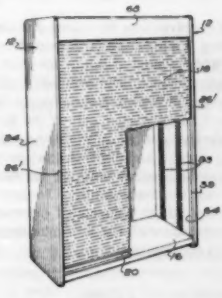
OFFICE CABINET

Joseph Clarkson, Seacroft, England, assignor to Thatchcode Limited, Great Britain

Filed Mar. 16, 1982, Ser. No. 358,695

Int. Cl.³ A47B *43/00*; E06B *9/14*

U.S. Cl. 312—257 SM **9 Claims**



1. In an office cabinet comprising a pair of end members each formed from a planar sheet metal blank bent so as to provide a plane face and edge faces extending around at least part of the periphery of the plane face, which edge faces are substantially wider than the thickness of the sheet metal and substantially narrower than the width of the plane face, the plane face forming a generally rectangular outer side surface of

the cabinet and the edge faces adjoining said side face at least at the front, top and rear of the cabinet,

the improvement wherein said sheet metal blank includes:

a generally rectangular area which corresponds to said plane face and has at least some rounded corners and straight edges extending from said corners,

edge forming portions contiguous with said area along said straight edges,

continuation of at least some of said edge forming portions projecting beyond the junction of one of said straight edges with said rounded corner, and

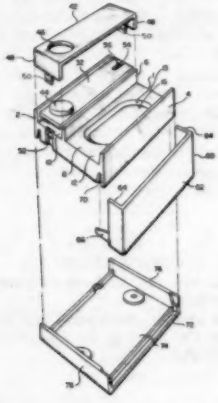
the blank being bent along said edges to turn said edge forming portions perpendicularly to the plane face and said continuations of said edge forming portions being curved to adjoin the rounded corners of the plane face such that the edge face formed by said edge forming portions and the continuations thereof curves around said rounded corners whereby the end member mimics the shape of a board with rounded corners.

4,441,769

LENS DISINFECTING UNIT

Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Apr. 19, 1982, Ser. No. 369,413
Int. Cl.³ A47B *47/00*; B65D *41/16, 41/18*
U.S. Cl. 312—270 **2 Claims**



1. A housing construction for a lens disinfecting unit or the like, said housing having a pair of spaced walls forming opposed walls of the housing; a cover for part of said housing, interfitting means on said cover and housing for retaining the housing and cover assembled, a lid in pivotal connection with the housing for closing another part of the housing, and a base for covering a further part of said housing, said base overlying said interfitting means and said pivotal connection in such manner as to prevent separation of the lid and cover from said housing; the cover, the base, and the lid when closed cooperating to define two additional sets of opposed walls for the housing that cooperate with the first-mentioned set of opposed walls to form an enclosure.

4,441,770

APPLIANCE ANTI-TIP DEVICE

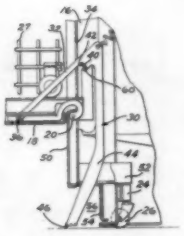
Bernard J. Brezosky, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 19, 1982, Ser. No. 409,746
Int. Cl.³ A47B *81/02*
U.S. Cl. 312—276 **2 Claims**

1. A freestanding cabinet adapted to be self-supporting on a floor surface having an access opening and an access door hinged about a horizontal axis for movement between a closed position and a fully open position where it is supported in a substantially horizontal position by a support means, said support means comprising:

an anti-tip member carried by said cabinet for allowing movement of said member from a retracted position to a tip-preventing position extending from the front of said cabinet in the door open position to a location adjacent said floor surface and outward of said cabinet;

a stop arm formed integral with said anti-tip member having an end connected to said access door for moving said anti-tip member between said retracted and extended tip-preventing position; and a leg portion engaging said floor when said anti-tip member is in its tip-preventing position;



means on said stop arm of said member including a stop surface area oriented perpendicular to the line of travel of said stop arm engaging a mating indexing surface secured relative to said cabinet at a location above said horizontal axis for positioning said door in its horizontal open position and to prevent tipping of said cabinet, in response to an incident of downward force on said door, tending to move said door downwardly from said open position; and

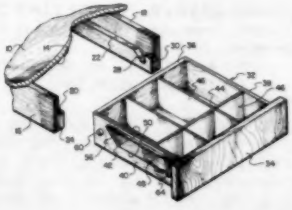
locking means on said stop arm adjacent said stop surface area being dimensioned to automatically engage holding means on said indexing surface on said cabinet when said leg portion is in engagement with said floor to prevent tipping of said cabinet in response to an incident of downward force on a part of said cabinet apart from said door, tending to tip said cabinet, and for automatically releasing said locking means from said holding means on said indexing surface when such downward force is removed.

4,441,771

DRAWER APPARATUS

Layton S. Roesler, 3515Mound St., Ventura, Calif. 93003

Filed Feb. 8, 1982, Ser. No. 346,483
Int. Cl.³ A47B *88/00, 88/18*
U.S. Cl. 312—322 **5 Claims**



1. A drawer apparatus comprising:

a side rail assembly comprised of a pair of substantially parallel spaced-apart side rails, each said side rail having an inner surface, said inner surfaces facing each other,

each said side rail having a cam surface, each said cam surface including a recess, each said side rail terminating at a front edge;

a drawer having an internal compartment enclosed by a front wall and a back wall interconnected by a pair of spaced-apart side walls, each said side wall having an exterior surface, each said exterior surface having a guide rail, each said guide rail extending from said front wall to a surface located directly adjacent said back wall but spaced therefrom, a said guide rail to slidably connect with a said cam surface to permit movement of said drawer relative to said side rail assembly, said movement of said drawer being between a closed position and an open position, said closed position not permitting access into said internal compartment, said open position permitting access into said internal compartment; and

a protruding member mounted on each said exterior surface with there being two in number of said protruding members, each said protruding member being located between its respective said surface and said back wall, each said protruding member to engage with a said recess when said drawer is in said open position, said protruding members and said recesses preventing disengagement of said drawer from said side rail assembly when in said open position, upon said drawer reaching said open position the entire said drawer pivots to an inclined position (relative to said closed position) with each said surface of each said guide rail abutting said front edge of a said side rail.

4,441,772

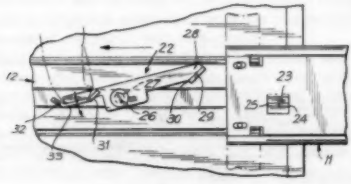
SEPARABLE BOTTOM MOUNTED DRAWER SLIDE

Brian S. Fielding, Chappaqua, and Fred S. Leiper, Valley Cottage, both of N.Y., assignors to Hardware Designers, Inc., Mt. Kisco, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,884

Int. Cl.³ A47B *88/16*

U.S. Cl. 312—330 R **7 Claims**



1. A frontwise removable bottom mounted drawer slide assembly comprising a fixed channel adapted to be mounted to a cabinet and a movable drawer channel adapted to be mounted to a drawer, antifriction means interposed between said channels and connecting said channels for longitudinal relative movement between telescoped and extended positions, said drawer channel having an outer end portion adapted to be disposed adjacent the face of a drawer and an inner end portion endwisely removable from said cabinet channel in said extended position, a self-coupling lock mechanism for connecting and disconnecting said channels, said mechanism including a stop member on said fixed channel, a pawl on said drawer channel having a first end adjacent said inner end of said drawer channel and an outer end spaced from said inner end, said pawl being mounted for pivotal movement about an axis intermediate said ends between first and second limiting positions, a latch surface on said pawl adjacent said inner end, said latch surface facing said outer end and being in the path of said stop member and clear of said stop member in said first and second positions respectively of said pawl, first cam means on said pawl inwardly positioned relative to said latch surface and disposed in the path of said stop member for co-acting with said stop member to shift said pawl from said first to said second position responsive to inward movement of said first cam past said stop member and second cam means on said pawl outwardly of said pivot for shifting said pawl from said second to said first position responsive to continued inward movement of said drawer channel relative to said cabinet channel.

4,441,773

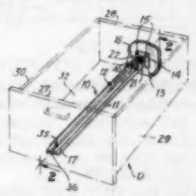
BOTTOM MOUNTED DRAWER SLIDE ASSEMBLY

Fred B. Leiper, Valley Cottage, N.Y., assignor to Hardware Designers, Inc., Mt. Kisco, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,521

Int. Cl.³ A47B *88/00*; F16C *21/00*

U.S. Cl. 312—330 R **7 Claims**



1. A bottom mounted drawer slide assembly comprising, in combination, a fixed channel member adapted to be mounted to a cabinet, said fixed channel member being U-shaped in vertical section, a drawer channel generally U-shaped in vertical section and including a horizontally disposed central web, antifriction means interposed between said channels and coupling the same for longitudinal movement between telescoped and extended relative positions, a fixed mounting flange adjacent a forward end of said drawer channel, said flange being formed from and disposed in a plane normal to said web, said flange being adapted to be secured to the front panel portion of a drawer by a horizontally directed fastener member, a plurality of mutually longitudinally spaced mounting apertures formed in said web adjacent the rear end thereof, a mounting bracket adapted to be seated selectively in one of said apertures in accordance with the depth of said drawer, said bracket including a channel attachment finger adapted to extend through a said aperture and engage against under portions of said web surrounding said aperture, said bracket having a drawer attachment disposed substantially at a right angle to said finger said leg including a fastener aperture adapted to receive a horizontal fastener member extending therethrough and into the rear panel of said drawer, thereby to couple said panel to said leg and said bracket to said web.

4,441,774

FLASH DEVICE OF A CAMERA

Kazuyuki Kazami, Tokyo, and Yoshiaki Ohtsubo, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,356

Claims priority, application Japan, May 14, 1980, 55-62737; May 15, 1980, 55-65580; May 15, 1980, 55-65581; May 16, 1980, 55-66202

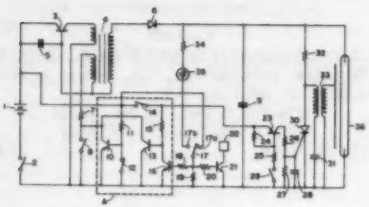
Int. Cl.³ H05B *41/32*

U.S. Cl. 315—241 P **10 Claims**

1. In a flash device for photography including a DC/DC converter for boosting a DC power source voltage and applying a voltage to a main capacitor for supplying energy for driving a flashlight tube, said converter having control means operative in response to the trigger operation by a start operating switch to stop the operation when the charging current of said main capacitor is reduced at a predetermined current value, the improvement comprising:

another switch means for enabling the operation of said converter independently of said start operating switch, said another switch means being operative to operate said converter until the charging voltage of said main capaci-

tor reaches a sufficient value to drive said flashlight tube; said another switch means including a switch circuit parallel-connected to said start operating switch, and a detect-



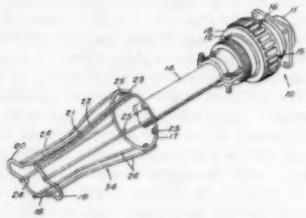
ing circuit for detecting the charging voltage of said main capacitor and inverting the operation of said switch circuit.

4,441,775

COUPLING AND DECOUPLING AID FOR AN ELECTRICAL CONNECTOR

Gerald E. Walters, Granada Hills, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Aug. 9, 1982, Ser. No. 406,329
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—89 R **6 Claims**



1. An aid for use in coupling and decoupling a plug and receptacle connector, the plug having a coupling housing that is rotatable to couple and decouple the connector depending on the direction of rotation, and a cable connected to the plug, comprising:

a member adapted for holding in the hand with a bore extending therethrough having a first opening of sufficient size to enable receipt onto the coupling housing and a second opening of sufficient size to enable receipt onto the cable;

means on an interior wall of the member defining the first opening for releasably engaging the coupling housing; and

first and second means extending from opposite sides of the member immediately adjacent and transversely of the member second opening.

4,441,776

QUICK DETACHABLE COUPLING

John W. Anhalt, Orange, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,457
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—91 R **11 Claims**

6. A quick detachable coupling comprising:

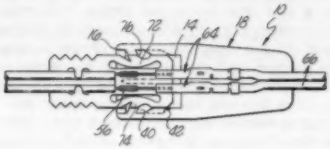
mating plug and receptacle members;

a recess opening at the front of said receptacle member slidably receiving said plug member therein, said recess being formed by upper and lower walls and first and second side walls;

means forming rearwardly facing latching shoulders on said side walls lying in a first plane generally parallel to said upper and lower walls;

means forming release slots below said latching shoulder forming means lying in a second plane generally parallel to said first plane;

said plug member having latching tabs on opposite sides thereof adjacent to said side walls, said tabs normally lying in said first plane behind said shoulders for latching said



members together and being vertically movable into said second plane, said tabs also being movable in said first plane toward each other for allowing the positioning of said tabs behind said shoulders upon mating of said plug and receptacle members; and

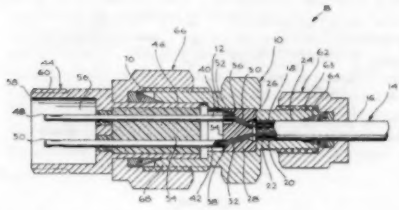
means for selectively shifting said tabs vertically into said release slots in said second plane to allow disengagement of said plug and receptacle members.

4,441,777

ELECTRICALLY SEALED CONNECTOR AND CABLE ASSEMBLY

Aramis Harootion, Northridge, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Sep. 29, 1982, Ser. No. 426,325
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—94 M **6 Claims**



1. An improved hermetically sealed heat resistant connector and cable assembly, said assembly comprising, in combination:

a. an elongated heat resistant connector body defining a central longitudinally extending passageway therethrough;

b. a sheathed cable containing a plurality of spaced leads, said cable being slidably disposed in one end of said passageway, said leads projecting from said cable in said passageway;

c. a dielectric element having apertures extending longitudinally therethrough within which are disposed said leads, said element being positioned adjacent said cable in said passageway;

d. a heat resistant connector plug slidably disposed in the opposite end of said passageway from said end containing said cable, said plug having a spaced parallel plurality of hollow pins extending longitudinally therethrough, aligned with said apertures of said dielectric element and receiving said leads; and,

e. locking means comprising heat resistant first and second lock nuts threadably releasably connected to opposite ends of said body, a first swaging cone releasably disposed

around said cable between said first nut and the adjacent body end and a second swaging cone disposed around said plug between said second nut and the adjacent body end, said lock nuts and swaging cones hermetically sealing said cable and plug in place in said connector body, thus hermetically protecting said cable leads and cable interior.

4,441,778

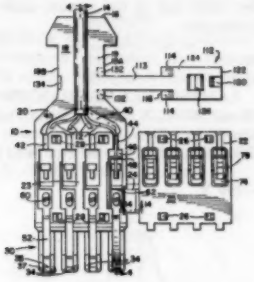
PATCHCORD CONNECTOR

Stephen A. Sampson, Wheaton, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 93,401, Nov. 13, 1979, abandoned. This application Oct. 9, 1981, Ser. No. 309,900

Int. Cl.³ H01R *13/39*

U.S. Cl. 339—99 R **15 Claims**



1. A patchcord connector for terminating at least one insulated conductor, comprising:

a housing comprising body members interlocked to form a closed body, said closed body defining at least one internal pocket with an access opening in communication with the exterior of said housing, said access opening being dimensioned to permit unimpeded insertion of a portion of said insulated conductor into said pocket;

at least one contact element mounted within said housing before said body members are interlocked to form said closed body, said contact element having a termination portion disposed within said pocket, said termination portion including means for piercing the insulation of an insulated conductor inserted into said pocket of said closed body, said contact element termination portion including means for locating said insulated conductor adjacent said piercing means; and

means associated with said closed body for driving a portion of said inserted insulated conductor into said piercing means to establish electrical connection between said contact element and said conductor without displacing said contact element, said driving means being operable from a point outside of said housing;

said housing consisting of first and second interlockable body members, at least one of said body members having a channel defining said pocket at the interface of said body members;

said positioning means of said termination portion of said contact element includes portions defining an aperture in communication with said piercing means, said aperture being of size sufficient to accommodate said insulated conductor, and adapted to receive a portion of said insulated conductor therethrough, said portion of said insulated conductor being driven from said aperture to said piercing means by said driving means;

said piercing means including means defining a slot with edges spaced at a distance less than the diameter of said conductor, said edges including means for cutting through said insulation and biting into said conductor;

said housing including an aperture overlying said piercing means and said driving means includes operating means mounted in said overlying aperture;

said operating means comprising a push button mounted for movement between a pre-termination position with said driving means separated from said insulated conductor, and a termination position with said conductor in electrical engagement with said contact element and said driving means abutting said insulated conductor;

said push button when in its pre-termination position being frangibly mounted in said aperture.

4,441,779

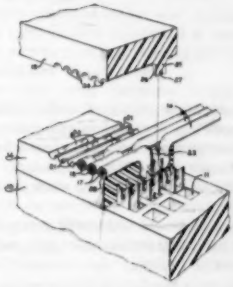
CONTACT DEVICE FOR A MULTICONDUCTOR CABLE

Wilhelmus T. M. Foederer, Best, and Francesco G. M. Voorn, Waalwijk, both of Netherlands, assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation of Ser. No. 221,886, Dec. 31, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,705

Int. Cl.³ H01R *13/39*

U.S. Cl. 339—99 R **4 Claims**



1. In a connector for multiconductor cable having a dielectric terminal support member supporting a multiplicity of terminals, each terminal having at least one bifurcated insulation wire piercing contact with a slit for receiving an insulated conductor at one end and another electrical contact at the other end, a dielectric cable support member, a dielectric terminal cover between said terminal support member and said cable support member and a multiconductor cable retained longitudinally between said terminal cover and said cable support member, the improvement comprising:

(a) mounting the terminals in three rows, two outer and one middle row, the outer rows containing terminals with the slit offset with respect to the center line of the terminal, one outer row of terminals being turned 180° with respect to the other row and the middle row containing terminals with the slit in line with the center line of the terminal, the slits in the terminals of each row being in a plane parallel to the slits in the terminals of adjacent rows,

(b) a multiplicity of recesses in a top surface of the terminal cover and a channel from each said recess to an exit in a bottom surface of the terminal cover, each recess accommodating the bifurcated end of a terminal when the terminal cover is mated with the terminal support member and

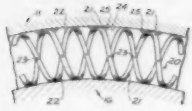
(c) the cable support member maintaining the cable in a U-shaped configuration by a slotted finger extending from a lower surface of the cable support member, the finger having its largest width extending transversely to the plane of the bifurcated insulation piercing contact so that when the connector is closed, one conductor is located within the slit of each terminal.

4,441,780

PLUG AND RECEPTACLE ELECTRICAL CONNECTOR

Gerald E. Walters, Granada Hills, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Sep. 30, 1982, Ser. No. 428,768
Int. Cl.³ H01R *13/648*
U.S. Cl. 339—143 R **8 Claims**



1. An electromagnetic energy shielding means for receipt within a groove on the inner wall of a plug connector part and which contacts a receptacle connector part when the plug and receptacle connector parts mate, comprising:

a first helically wound coil spring arranged in a continuous closed path;

a second helically wound coil spring arranged in a continuous closed path, said second coil spring being interleaved with the first coil spring;

means conductively bonding crossover points of the first and second coil springs; and

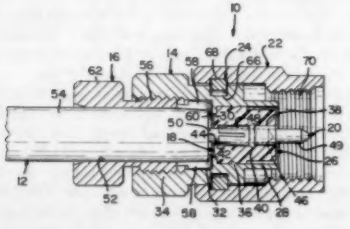
means for conductively securing one of said spring coils to plug connector part walls defining the groove.

4,441,781

PHASE-MATCHED SEMIRIGID COAXIAL CABLE AND METHOD FOR TERMINATING THE SAME

Edgar W. Forney, Jr., Harrisburg, and Richard S. Hogendobler, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 17, 1982, Ser. No. 408,958
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—177 R **4 Claims**



1. A method for terminating a length of coaxial cable to a selected electrical length comprising the steps of:

cutting the coaxial cable to the selected electrical length;

permanently terminating one end of the coaxial cable with a coaxial connector;

positioning a phase-matching test connector onto the other end of the coaxial cable;

measuring the phase angle of the coaxial cable to determine the electrical length of the coaxial cable;

removing the test connector from the coaxial cable, and if the electrical length of the coaxial cable is correct, permanently terminating the other end of the coaxial cable with another coaxial connector;

or, if the electrical length is not correct, removing the test connector from the coaxial cable, trimming the other end of the coaxial cable to the correct electrical length, positioning the test connector onto the trimmed end, measuring the phase angle of the trimmed coaxial cable to make certain the electrical length is correct, removing the test connector from the coaxial cable, and permanently terminating the other end of the coaxial cable with another coaxial connector.

4,441,782

LAMPSOCKET MECHANISM

Manfred M. Kneer, Icard, N.C., assignor to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Feb. 11, 1982, Ser. No. 348,110
Int. Cl.³ H01R *13/50*
U.S. Cl. 339—199 R **15 Claims**

1. A lampsocket mechanism for holding an incandescent lamp, said lamp being of the type having a screw base having an electrical contact portion approximately at the center of said base, said base being rotatable about an axis of rotation, said mechanism comprising:

an electrically nonconductive body forming a socket capable of receiving said screw base of said lamp,

a centrally located contact means mounted on said body for electrically contacting said electrical contact portion of said screw base,

thread segment means within said socket unitary with said body for engaging the threads of said screw base, said thread segment means and said screw base cooperating to press said electrical contact portion of said screw base longitudinally against said centrally located contact means when said screw base is manually screwed into said socket,

bias contact means mounted within said socket opposed to said thread segment means, said bias contact means being biased inwardly and being in bias contact with said screw base along a plurality of longitudinal lines of thrust when said base is screwed into said socket, said bias contact means being for laterally pressuring against said screw

base along a plurality of planes formed by said longitudinal lines with said axis of rotation, whereby the screw base is laterally aligned in the socket and the electrical contact portion of the screw base is centered into alignment with the first contact means, said bias contact means also being for electrically contacting the screw base of said lamp,

a first electrical lead connected to said centrally located contact means, and

a second electrical lead connected to said bias contact means, said bias contact means including a resilient member having a plurality of planar faces, each face being mounted diametrically and longitudinally opposite to said thread segment means and each face bing capable of exerting equal lateral pressures along said lines of thrust in an axial direction against said screw base.

4,441,783

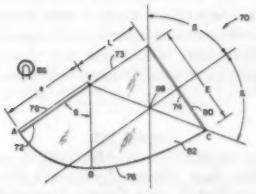
VESSEL NAVIGATION LIGHTS

Alexander J. Houghton, Annandale, and Thomas M. Knasel, McLean, both of Va., assignors to Science Applications, Inc., La Jolla, Calif.

Division of Ser. No. 149,962, May 15, 1980, Pat. No. 4,367,519. This application Sep. 23, 1982, Ser. No. 421,915

Int. Cl.³ G02B *5/14*; F21V *7/00*

U.S. Cl. 350—96.10 **5 Claims**



1. An optical element for navigational lights and the like, comprising an asymmetrical light diverger having a light entry plane for receiving diffuse light, a light exit plane positioned in spaced normal relation to said light entry plane, and at least one curved surface, which is in part parabolic, connecting said planes for diverging diffuse light from said light entry plane into a virtual line of luminous energy, the light from said line being transmitted through said light exit plane over a precise arc of visibility.

4,441,784

PARABOLOIDAL COUPLER FOR LIGHT WAVE GUIDES

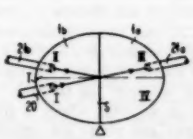
Hans-Erdmann Korth, Stuttgart, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1981, Ser. No. 258,868

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019955

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.15 **10 Claims**



1. A coupler assembly comprising a pair of couplers, each of said couplers including a light transmitting body having the configuration of a paraboloid of revolution, said body having a flat face perpendicular to an axis of symmetry and a connection for at least one optical fiber at or near its point of focus, said couplers being arranged with their respective flat faces in adjacent, parallel relationship.

4,441,785

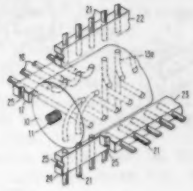
ROTARY FIBER OPTIC SWITCH

James R. Petrozello, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,185

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.20 **3 Claims**



1. A rotary fiber optic switch for controlling and distributing light signal impulses comprising;

a cylindrical housing;

a drum rotatably mounted within said housing;

a plurality of cable sockets positioned at specific locations around the periphery of said housing and communicating with the periphery of said drum;

an input fiber optic cable connected to one of said cable sockets and having a plurality of fiber optic strands communicating with the periphery of said drum and each of which may transmit a series of input light signal impulses;

a plurality of output fiber optic cables, there being one connected to each of the remaining cable sockets and communicating with the periphery of said drum;

a plurality of output fiber optic strands in each one of said output cables and communicating with the periphery of said drum for transmitting a plurality of output light signal impulses;

a plurality of light conductive elements arranged within said drum, there being one conductive element associated with each one of said input fiber optic strands for transmitting the input light signal impulses from said input cable to the output fiber optic strands in one or more of said output cables; and

means for selectively positioning said drum and light conductive elements to complete one or more light paths between said input fiber optic cable and simultaneously more than one of said output fiber optic cables.

4,441,786

DEVICE FOR POSITIONING OPTICAL FIBERS IN A TERMINAL CONNECTOR FOR SPLICING TWO OPTICAL FIBER TRANSMISSION CABLES

Jean P. Hulin; Andre Bouvard, and Patrick LeMaitre, all of Conflans Ste Honorine, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans Ste Honorine, France

Filed Oct. 30, 1981, Ser. No. 316,912

Claims priority, application France, Nov. 3, 1980, 80 23464

Int. Cl.³ G02B *7/26*

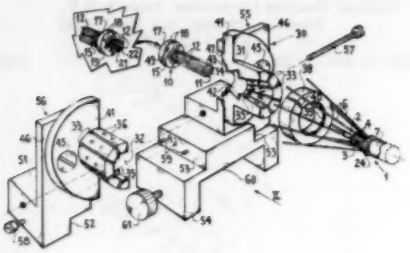
U.S. Cl. 350—96.21 **13 Claims**

1. A device for positioning optical fibers in grooves of a terminal connector for splicing two optical-fiber transmission cables, said connector defining an outer connector periphery in which said grooves are formed, said device comprising:

an optical-fiber insertion piece defining an outer insertion piece periphery and comprising a central recess provided substantially over all its length, and radial slits formed in said outer insertion piece periphery and extending substantially over all the length of said insertion piece, said connector being fitted into said central recess so that each

groove is disposed opposite a slit of said insertion piece; and

optical-fiber distribution means mounted freely rotatable on said insertion piece and having a longitudinal slit intended to come successively opposite each slit of said insertion



piece, the optical fibers being presented one by one to the slit of said distribution means so that, by rotation of said distribution means, each optical fiber penetrates into a groove of said connector through the slit of said distribution means positioned opposite a slit of said insertion piece.

4,441,787

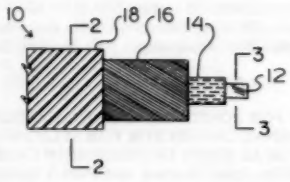
FIBER OPTIC CABLE AND METHOD OF MANUFACTURE

Rosemary K. Lichtenberger, Elgin, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 29, 1981, Ser. No. 258,618

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.23 **10 Claims**



9. A fiber optic cable comprising:

an optical fiber, including a core, a cladding extending longitudinally about and upon the core, and a buffer jacket extending about and upon the cladding;

a tetrafluoroethylene grease coating extending upon said optical fiber and having a Young's modulus less than the Young's modulus of the aforementioned buffer jacket;

a textile serve extending helically about said tetrafluoroethylene grease coating and in contact therewith; and

a cable jacket extending longitudinally about and upon said serve;

whereby, said tetrafluoroethylene grease coating maintains the concentricity of said optical fiber and said textile serve.

4,441,788

OPTICAL WAVE GUIDE WITH FLUORINE-DOPED CORE

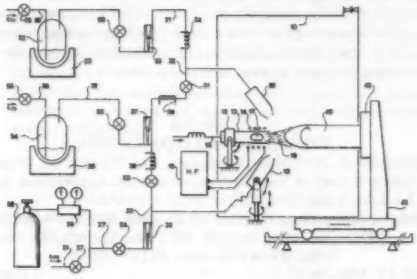
Pierre Guerder, Pithiviers, and Andre Ranson, Rueil Malmaison, both of France, assignors to Quartz et Silice, Paris, France

Filed Dec. 15, 1981, Ser. No. 331,018

Claims priority, application France, Dec. 16, 1980, 80 26670

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.34 **8 Claims**



1. An optical waveguide formed with a core made of a vitreous material containing fluorine and coated with at least a distinct peripheral layer, wherein the core of said waveguide is made of a silica glass in which fluorine is uniformly distributed.

4,441,789

RESONANCE ABSORBER

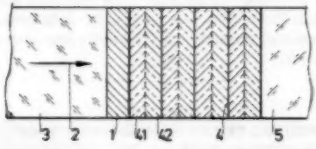
Hubert Pohlack, Jena, German Democratic Rep., assignor to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Mar. 26, 1981, Ser. No. 247,956

Claims priority, application German Democratic Rep., Mar. 31, 1980, 220063; Apr. 1, 1980, 220110

Int. Cl.³ G02B 5/28, 5/22

U.S. Cl. 350—166 **6 Claims**



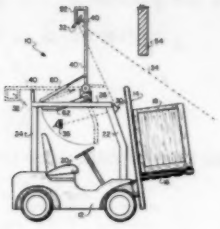
1. In a resonance absorber for the absorption of impinging photons of electromagnetic radiation having an effective wavelength λ, said resonance absorber including (1) an absorption material of refractive index n and absorption coefficient k and having a medium of refractive index n_a disposed frontally thereof; (2) an external optical element positioned posteriorly of said absorption material, and (3) a series of interference layers located between said absorption material and said external optical element, each of said interference layers having an optical thickness of substantially $\lambda/4$, and the series of layers arranged to have alternatingly low and high refractive indices, the improvement wherein: the thickness of said absorption material is equal to $m\lambda/(4n)$, where m is the whole number closest to $2n_a/(\pi k)$, and where the refractive index n of the absorption material equals the refractive index n_a of the said medium disposed frontally of said absorption material, and wherein the interference layers have alternatingly low and high refractive indices in that order when m is even and alternatingly high and low refractive indices in that order when m is odd.

4,441,790

LIFT TRUCK SAFETY MIRROR

David M. Williams, 165 Riker Ter., Salinas, Calif. 93901, and Charles L. Curtis, 295 Zabala Rd., Salinas, Calif. 93908

Filed Aug. 7, 1981, Ser. No. 290,853
Int. Cl.³ B60R 1/10
U.S. Cl. 350—302 11 Claims



1. An overload viewing system for a fork lift truck type cargo handling vehicle for viewing forwardly over a forward positioned load, said viewing system comprising:

a first mirror in the line of sight of the vehicle operator,

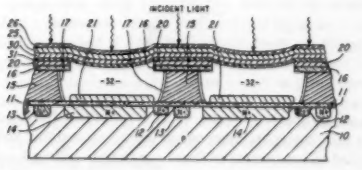
a pivoting arm assembly, and a second mirror mounted on said pivoting arm assembly above said first mirror for pivotal movement between a viewing position to establish a line of sight from the operator via said first mirror and said second mirror forwardly over a normal forward positioned load of said vehicle, and a retracted position to permit passage of the vehicle beneath a low clearance.

4,441,791

DEFORMABLE MIRROR LIGHT MODULATOR

Larry J. Hornbeck, Van Alstyne, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 183,595, Sep. 2, 1980, abandoned. This application Jun. 7, 1982, Ser. No. 386,141
Int. Cl.³ G02F 1/29
U.S. Cl. 350—360 43 Claims



1. A light modulating semiconductor device comprising:

a semiconductor substrate of one conductivity type;

a layer of insulating material disposed on one surface of said substrate;

a first doped region of the other conductivity type disposed in said substrate;

a member of conductive material disposed on said insulating layer above said first doped region of the other conductivity type and extending upwardly from said substrate;

membrane means including at least one conductive layer disposed upon said conductive member and extending across said substrate in spaced relationship with respect to said insulating layer, said membrane means having a light reflective surface exposed to incident light;

a conductive element disposed on said insulating layer and overlying said substrate in offset relationship with respect to said first doped region of the other conductivity type and said conductive member extending upwardly from said substrate;

a second doped region of the other conductivity type disposed in said substrate and extending to said one surface thereof, said second doped region of the other conductivity type being substantially disposed beneath said conductive element and spaced therefrom by said insulating layer interposed therebetween;

said conductive element being spaced from said membrane means so as to define an air gap therebetween, said conductive element and said conductive layer of said membrane means respectively serving as opposed field plates with the air gap therebetween to comprise an air gap capacitor; and

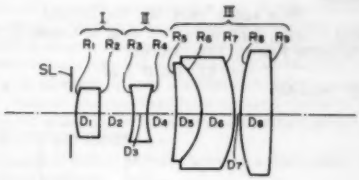
said membrane means being deflectable in a direction toward said conductive element in response to the charge placed on said air gap capacitor.

4,441,792

TELECENTRIC PROJECTION LENSES

Masamichi Tateoka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1981, Ser. No. 238,412
Claims priority, application Japan, Mar. 4, 1980, 55-27735; Mar. 4, 1980, 55-27736
Int. Cl.³ G02B 13/22
U.S. Cl. 350—415 8 Claims



1. A telecentric projection lens comprising:

a first lens component composed of a single lens of positive refractive power;

a second lens component composed of a bi-concave lens of negative refractive power; and

a third lens component including at least two positive lenses one having a cemented surface whose center of curvature is spaced from the surface towards the object field side, said first, second and thrid lens components being arranged in the recited order as viewed from the object field side and satisfying the conditions:

$$1.69 \leqq |f_1/f_2| \leqq 2.55$$

$$-0.33 \leqq f_2/f \leqq -0.19$$

$$0.41 \leqq f_3/f \leqq 0.59$$

wherein f_1, f_2 and f_3 are focal lengths of said first, second and third lens components, respectively, and f is the focal length of the whole lens system.

4,441,793

MICROSCOPIC EVALUATION SLIDE

Carlos D. Elkins, 1414 S. Fairplain Ave., Whittier, Calif. 90601

Filed Jan. 10, 1983, Ser. No. 456,700
Int. Cl.³ G02B 21/34
U.S. Cl. 350—536 12 Claims

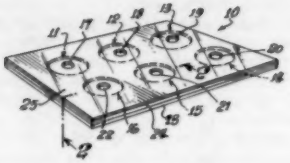
1. A microscopic evaluation slide for viewing liquid specimens, said sliding comprising:

a base having at least one flat viewing area;

side walls extending from the base completely surrounding said viewing area;

a transparent cover sheet affixed to said side walls in a sealed relationship therewith, said transparent cover sheet hav-

ing a flat, planar upper surface and said cover sheet completely covering said base and having at least one opening



therethrough and said cover sheet being positioned about parallel to the flat viewing area and between 0.001 and 0.020 inches therefrom.

4,441,794

ADJUSTABLE SUN SCREEN FOR CAMERA LENS

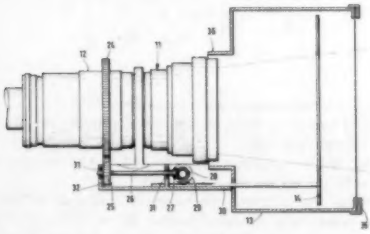
Roger C. Field, Cincinnati Str. 41, 8000 Munich, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,482

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1980, 8020870; Feb. 23, 1981, 3106631

Int. Cl.³ G02B *7/22*

U.S. Cl. 350—580 **29 Claims**



1. In a camera having a lens adapted to be mounted thereto and including a rigid sunshade mounted thereon having a fixed field of view to restrict the angle of light entry to said lens, the improvement comprising a mask disposed within the sunshade for screening light, and means for supporting said mask in a position in front of the lens and within the sunshade, said means for supporting said mask including means for axially adjusting the position of the mask relative to and within the sunshade in accordance with the focal length of the lens so as to limit the field of view of the lens through the sunshade.

4,441,795

MOLDED MULTIFOCAL LENS AND MOLD ASSEMBLY

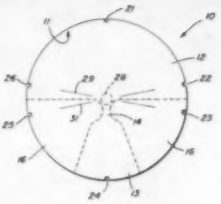
Alban J. Lobdell, Plantation, Fla., assignor to Camelot Industries Corporation, Burlington, Mass.

Filed Mar. 24, 1980, Ser. No. 133,186

Int. Cl.³ B29C *11/00*; B29D *11/00*; G02C *7/06*

U.S. Cl. 351—169 **11 Claims**

10. In a molded multifocal lens otherwise having no inherently visible multifocal lens features, the improvement comprising a plurality of notches formed by a gasket having notch defining means, said notches being formed at the time of molding and located in the edge thereof at precise positions around said lens for use in visually identifying by means of the unaided



human eye and locating specific optical features of and on said lens.

4,441,796

FILM SUPPORT ELEMENT ASSEMBLY

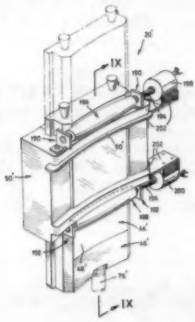
William C. Shaw, Streetsville, Canada, assignor to Imax Systems Corporation, Toronto, Canada

Continuation-in-part of Ser. No. 290,630, Aug. 6, 1981, Pat. No. 4,365,877. This application Aug. 12, 1982, Ser. No. 407,524

The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.

Int. Cl.³ G03B *1/00*

U.S. Cl. 352—184 **13 Claims**



1. A projector, camera or like apparatus having a rolling loop film transport mechanism including a stator and a rotor adapted to co-operate to form continuous rolling loops in said film and to cause transportation thereof through the apparatus along a film path which includes an aperture;

wherein the improvement comprises:

a film support element assembly disposed at the position of said aperture and comprising: an elongate lens element having a film support surface across which successive portions of a film of known width can be laid during transportation of said film in said film transport path; means supporting said lens element for movement in a direction generally normal to said path between first and second positions in which respectively different portions of said film support surface are disposed in said path; said film support surface of the lens element being continuous and of uniform cross-sectional shape and having a length sufficiently in excess of twice the width of the film that said movement of the lens element between its first and second positions will cause a portion of said film support surface in said path to move to a position adjacent to and clear of said path; and cleaning means adapted to remove debris from a said portion of said film support surface which has been moved out of said path.

4,441,797

ELECTRONIC FLASH DEVICE CAPABLE OF AUTOMATICALLY CONTROLLING THE QUANTITY OF A FLASH OF LIGHT

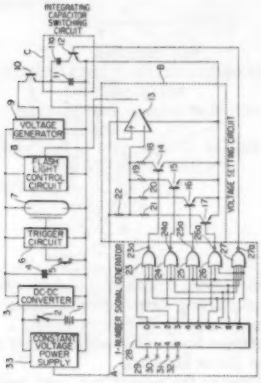
Yuji Maruyama, and Katsumi Horinishi, both of Osaka, Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed Dec. 14, 1982, Ser. No. 449,610

Claims priority, application Japan, Dec. 14, 1981, 56-186940[U]; Dec. 14, 1981, 56-186941[U]; Dec. 14, 1981, 56-186944[U]

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—416 4 Claims



1. An electronic flash device capable of automatically controlling the quantity of a flash of light in response to a preselected f number of a camera comprising

(a) a flash lamp which is connected to a main flash capacitor and which is adapted to convert the energy stored on said main flash capacitor into light,

(b) a comparator with a first input terminal to which is applied a reference voltage and a second input terminal to which is applied a voltage derived from an integrator means which is adapted to totalize the photocurrent flowing through a photosensor means which in turn responds to the intensity of light reflected back from a subject,

(c) a flash light control circuit which is responsive to the electrical signal derived from said comparator so as to extinguish said flash lamp,

(d) an f number signal generator means which receives binary coded signals, each representing each of a plurality of f-numbers, from a camera or an arithmetic circuit incorporated in said electronic flash device and which is adapted to convert the received binary coded signal into a coded signal representative of the received binary coded signal which in turn represents a selected f number,

(e) a control circuit for controlling said flash light control circuit which receives the coded output signal from said f number signal generator means and which produces said reference voltage which corresponds to said received coded output signal, and

(g) an integrating capacitor-switching circuit which responds to the coded output signal from said f number signal generator means so as to select a combination of a plurality of capacitors of an integrator means corresponding to said coded output signal received,

whereby, the control signal to be applied to said flash light control circuit can be varied in response to said selected f number.

4,441,798

CAMERA HAVING A LIQUID CRYSTAL FOCUSING SCREEN

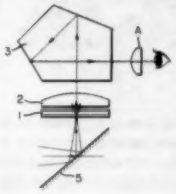
Koji Watanabe; Yoshihiro Higuchi; Michio Yagi, and Kazuo Shiozawa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 186,349, Sep. 12, 1980, abandoned. This application Oct. 6, 1982, Ser. No. 433,021

Claims priority, application Japan, Sep. 14, 1979, 54/118398

Int. Cl.³ G03B *7/00*

U.S. Cl. 354—483 2 Claims



1. In a camera including a source of electric voltage and in which light reflected from a subject to be photographed is passed through the focusing screen,

the focusing screen comprising a pair of substantially flat, transparent members spaced apart in substantially parallel relation so as to dispose a surface of each said member in confrontingly opposed relation to said surface of the other of said members, at least a transparent electrode mounted on each of said confrontingly opposed surfaces, and a current effect mode liquid crystal disposed in the space between said members,

a changeover switch movable between a first position and a second position,

means connecting said electrodes of the focusing screen to the electric voltage source through said changeover switch so that operating voltage is applied to said focusing screen by impression on said electrodes in said second position of the changeover switch but not in said first position thereof,

means for measuring the amount of light passed through the focusing screen and for outputting a signal in accordance with said measurement,

an exposure control circuit, and

switching means connected to said changeover switch and said exposure control circuit for causing said output signal of the light measuring means to be transmitted to said exposure control circuit only when said changeover switch is in said second position thereof whereby operating voltage is applied to said focusing screen.

4,441,799

CAMERA WITH A LENS PROTECTIVE COVER

Fujio Enomoto, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 3, 1982, Ser. No. 374,034

Claims priority, application Japan, Jul. 1, 1981, 56-102472

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—145.1 13 Claims

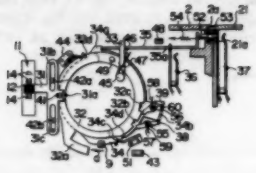
1. A camera with a lens protective cover which is movable between a first position in which it covers the front side of a taking lens and a second position in which it permits the taking lens to be exposed, the camera being adapted to utilize an electronic flash which is either internally housed therein or detachably mounted thereon, by comprising:

switching means for turning on a power supply of an electronic flash to establish a flash photography mode;

a connection mechanism for returning the switching means to a position other than the flash photography mode in interlocked relationship with the movement of the lens protective cover as the latter is closed when the switching

means is left in a position establishing a flash photography mode; and

said switching means being connected through said connection mechanism to a distance adjustment unit associated



with said taking lens in a manner such that whenever said switching means assumes a position in which a flash photography mode is established, said taking lens is automatically focused to a focus setting suitable for flash photography.

4,441,800

DRIVING SYSTEM IN CAMERA

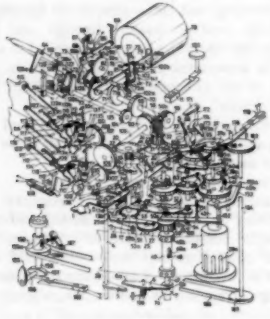
Yoshiyuki Nakano, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,347

Claims priority, application Japan, May 25, 1981, 56-77938; May 25, 1981, 56-77939

Int. Cl.³ G03B *19/12*

U.S. Cl. 354—152 **10 Claims**



1. In a camera including displacement means displaceable by the driving force of a driving source from a position corresponding to the maximum aperture of a taking lens to a position corresponding to the minimum aperture of said lens so as to stop down the aperture and particular devices operable after the displacement of said displacement means, a device for controlling said aperture comprising:

means for regulating the speed of displacement of said displacement means, said speed regulating means including

means for accumulating mechanical energy to be used for operating said particular device or devices;

means for connecting said energy accumulating means to said driving source during the displacement of said displacement means thereby accumulating the mechanical energy by a portion of the driving force from said driving source; and

locking means for inhibiting said displacement means against further displacement when said aperture has been stopped down to a determined aperture value.

4,441,801

MOTOR DRIVEN CAMERA

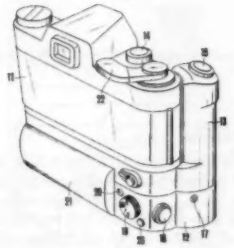
Yukio Mashimo, and Tomonori Iwashita, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 81,334, Oct. 3, 1979, Pat. No. 4,367,937, which is a continuation of Ser. No. 888,469, Mar. 2, 1978, abandoned. This application Jul. 20, 1981, Ser. No. 285,042

Claims priority, application Japan, Mar. 24, 1977, 52-32492; Apr. 11, 1977, 52-41094

Int. Cl.³ G03B *1/18, 17/38*

U.S. Cl. 354—173.11 **1 Claim**



1. An electric driving device for a camera, comprising:

a camera body having a control circuit and a first terminal for adding a signal to the control circuit,

an electrical drive device removably attached to the camera body, said device including:

(a) a grip fitted to the camera body and having an upper surface and a side face,

(b) a first operating member on the upper face of the grip,

(c) a second operating member on the side face of the drive device,

(d) a first switch associated with the operation of the first operating member,

(e) a second switch associated with the operation of the second operating member, and

(f) a second terminal electrically connected to the first terminal when the drive device is attached to the camera body, for adding a signal corresponding to the switching action of the first or second switch to the control circuit.

4,441,802

ALBADA FINDER DEVICE

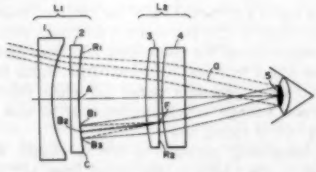
Yutaka Iizuka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,468

Claims priority, application Japan, Jun. 3, 1980, 55-74539

Int. Cl.³ G03B *13/08*

U.S. Cl. 354—224 **3 Claims**



1. In an Albada finder device including: a field frame provided on an eyepiece lens so as to be capable of reflecting part of the light from an objective lens; and a reflecting surface provided on the objective lens to reflect the reflected light from said field frame to the eyepiece lens to indicate a bright

frame within the finder view field and including a central area containing the optical axis and passing light therethrough, and a marginal area formed around said central area and having a reflection factor greater than that of said central area; the improvement residing in that said reflecting surface further includes:

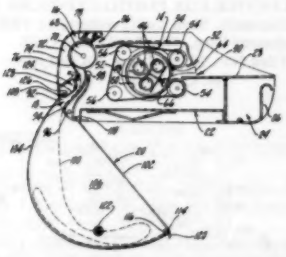
a boundary area provided between said central area and said marginal area and having a reflection factor continuously varying so as to be smaller toward said optical axis, said boundary area being formed in an annular shape having a width substantially equal to the diameter, on said reflecting surface, of a reflected light beam passing from a point of said field frame to the circumference of the exit pupil of said finder device.

4,441,803

DIAZO COPY MACHINE WITH AMMONIA FUME ELIMINATOR

Giovanni Pelis, Bergamo, Italy, assignor to Northwest Blueprint & Supply Co., Livonia, Mich.

Filed Jun. 1, 1982, Ser. No. 383,489
Int. Cl.³ G03D *7/00*
U.S. Cl. 354—299 **10 Claims**



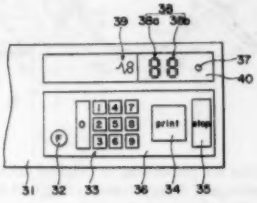
1. A machine for developing light sensitive copy material by contact with ammonia developing gases comprising, a degasser passage constructed and arranged for developed copy material to pass through after being contacted with the ammonia developing gases, heater means cooperating with said degasser passage and constructed and arranged to heat the developed copy material to an elevated temperature to accelerate the release of ammonia vapor from the copy material, an enclosed receptacle communicating with said degasser passage and constructed and arranged to receive developed copy material from said degasser passage, said receptacle having a bottom wall of a flexible and impervious material generally underlying said degasser passage and being curved and constructed and arranged to cooperate with said degasser passage to deposit copy material emerging from said degasser passage into said receptacle, a pair of end walls of a flexible and impervious material spaced apart in generally opposed relation and each having a generally lower curved edge sealed to said bottom wall, an air inlet opening disposed in at least one of said walls of said receptacle, a cover of a flexible and impervious material normally overlying said bottom wall and having a free edge normally overlaying and engaging an edge of said bottom wall to provide a closed and sealed receptacle, said cover also being constructed and arranged such that said free edge can be lifted from said bottom wall to provide an outlet for removal of developed copy material from said receptacle, and a blower constructed and arranged to move a stream of air through said air inlet, around developed copy material in said receptacle and through at least a portion of said degasser passage such that essentially all ammonia is removed from developed copy material received in said receptacle before such developed copy material is removed from said receptacle.

4,441,804

ELECTROSTATIC COPYING APPARATUS INCLUDING A SWITCH CHECKING SYSTEM

Kenji Shibazaki, Aichi, and Masazumi Ito, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 4, 1981, Ser. No. 261,135
Claims priority, application Japan, May 12, 1980, 55-63146; Mar. 23, 1981, 56-42703
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **6 Claims**



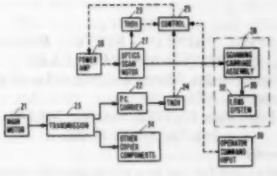
1. In an electrostatic copying apparatus provided with a switch to be operated through an operation of a movable member of the copying apparatus and provided with a controlling apparatus which has a program for judging the operating condition of said switch so as to output given controlling signals, a switch checking system wherein said controlling apparatus has a controlling mode for switch checking use and a program for displaying the changing-over condition of said switch when said switch has been operated in said controlling mode, whereby the switch is adapted to be checked through the mode changing-over operation operation of said controlling apparatus.

4,441,805

MEANS FOR POSITIONING OPTICAL COMPONENTS FOR A VARIABLE MAGNIFICATION/REDUCTION COPIER OPTICS SYSTEM

Gerald L. Smith, Broomfield, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,864
Int. Cl.³ G03G *15/28*
U.S. Cl. 355—14 R **16 Claims**



1. A variable reduction optical system for use with a document copier machine comprising:

a drive motor means for driving machine components during copy reproduction;

a lens assembly; and

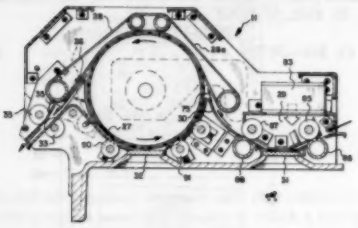
an optics positioning system for use in altering the position of said lens in order to achieve a selected reduction ratio, said positioning system including disconnectable coupling means for connecting said lens assembly and said drive motor means for altering the position of said lens in response to rotation of said drive motor means, the connection provided by said coupling means being removed for the normal copying operation.

4,441,806

DOCUMENT EXPOSURE APPARATUS

James W. Davis, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 356,016
Int. Cl.³ G03B *27/32*
U.S. Cl. 355—23 **8 Claims**



1. Apparatus for presenting an original document to a first scanning station and thence transporting said document alternatively either directly to an output tray or to a second scanning station, followed by movement to said output tray, said apparatus comprising:

a. a frame;

b. a lid hingedly connected to said frame;

c. a document transport assembly hingedly connected to said frame and housed within said lid for transporting said document in a first direction past said first scanning station and thence continuing generally in said first direction toward said output tray;

d. a rotatable document reversing drum hingedly connected to said frame and housed within said lid separate from and cooperable with said document transport assembly for receiving said document from said document transport means, inverting said document, transporting said document in a second direction opposite said first direction for presentation to said second scanning station, and returning said document to said document transport assembly for movement to said output tray;

e. gate means for selectively removing said document from said drum and directing said document to said output tray; and

f. means for enabling said transport assembly to be latched to said lid such that both may be raised to an upwardly hinged position together.

4,441,807

PHOTOGRAPHIC PRINTING SYSTEM INCLUDING AN IMPROVED MASKING CARD

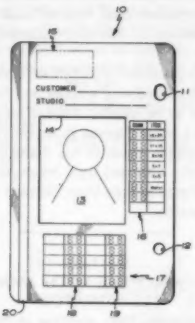
Stephen A. Bartz, Jordan, Minn., assignor to Lucht Engineering, Inc., Minneapolis, Minn.

Filed Feb. 17, 1982, Ser. No. 349,649
Int. Cl.³ G03B *27/52*
U.S. Cl. 355—40 **7 Claims**

1. A masking card for use in a photographic printing system of the type wherein a transparency bearing an image to be printed is positioned within a photographic printer, the transparency being carried by the masking card with the image to be printed at an aperture thereof and the card contributing to registration of the image within the printer, the masking card improvement for the automatic control of printer exposure parameters which comprises:

a plurality of mark boxes in predetermined locations on said card, each mark box location representing a printer exposure parameter with at least some of said mark box locations representing exposures of preselected size and at least some of said mark box locations having preprinted ghost character outlines of an optically readable character font; and

information storage means carried by said card including a plurality of data blocks dedicated to a printer exposure



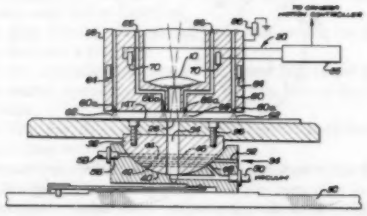
parameter including printer exposure parameters represented by said mark box locations.

4,441,808

FOCUSING DEVICE FOR PHOTO-EXPOSURE SYSTEM

Thomas P. Giacomelli, Simi, Calif., assignor to TRE Semiconductor Equipment Corp., Woodland Hills, Calif.

Filed Nov. 15, 1982, Ser. No. 441,648
Int. Cl.³ G03B *27/42*
U.S. Cl. 355—53 **4 Claims**



1. An apparatus useful in a step and repeat semiconductor wafer photo-exposure system of the type having a camera for sequentially exposing different areas on said wafer to produce semiconductor devices, said apparatus achieving spaced parallel alignment of the surface of said semiconductor wafer with a reference plane that is associated with the body of the camera of said system and is in spaced facing relationship with said wafer surface, comprising:

a platform for supporting said wafer;

a spherical air bearing mounting for said platform;

a plurality of first channels in said camera body for conducting gas under pressure to first openings in said camera body facing said wafer surface so as to form gas jets directed toward said semiconductor wafer;

first pressure sensors associated with each of sad channels to sense the gas back-pressure therewithin,

means for applying gas via said channels so that the force of said gas jets applied against said wafer will cause said wafer and said platform to move within said air bearing mounting until the back-pressure condition indicating that the distance from each of said openings to said wafer surface is equal, whereby said parallel alignment between said semiconductor wafer and the reference plane of said camera body is achieved;

vacuum clamping means for locking with said spherical air bearing mounting to prevent further movement of said platform therewithin, said vacuum clamping means being

actuated upon detection by said sensors of said equal back-pressure condition;

a plurality of second channels in said camera body for conducting gas under pressure to second openings in the camera body facing said wafer surface so as to form gas jets directed toward said semiconductor wafer, wherein the second openings are located so that the gas jets strike the semiconductor wafer adjacent the exposure field of the camera;

second pressure sensors associated with each of said second channels to sense the gas back-pressure therewithin;

means for moving said camera body toward and away from said semiconductor wafer; and

focusing means for causing said moving means to move said body relative to said wafer until the average level of back-pressure sensed at all of the said second sensors is equal to a predetermined value, said value corresponding to a spacing between said body end and said wafer at which said camera is most accurately focused on said surface.

4,441,809

METHOD AND APPARATUS FOR DETERMINING POSITION

James R. Dudley, 27 Colville Rd., Walthamstow, London E17, and Barry J. Gorham, 55 Roundmead Ave., Loughton, Essex, both of England

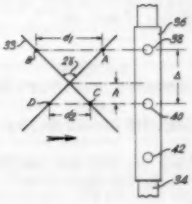
PCT No. PCT/GB80/00169, 371 Date May 29, 1981, 102(e) Date May 29, 1981, PCT Pub. No. WO81/01195, PCT Pub. Date Apr. 30, 1981

PCT Filed Oct. 16, 1980, Ser. No. 269,044

Claims priority, application United Kingdom, Oct. 16, 1979, 7935790; Apr. 2, 1980, 8011177

Int. Cl.³ G01C *3/10, 3/08*

U.S. Cl. 356—1 **8 Claims**



1. Position sensing apparatus comprising generating means **(12)** for generating a beam of radiation; rotation means **(24)** for rotating the beam to define a reference plane, characterised by the beam having an effective sectional shape such that a leading edge and a trailing edge are straight and diverge from each other on at least one side of the reference plane; at least two radiation sensors **(38, 40)** spaced a known distance apart in a direction parallel to the axis of rotation of the beam; and means **(30, 32, 44, 46)** for determining the distances between the leading and trailing edges at the positions along those edges which pass across each sensor whereby the distance of each sensor from the reference plane and the distance of the sensors from the axis of rotation can be determined.

4,441,810

RANGE FINDER

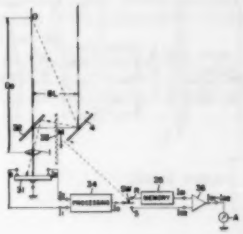
Haruhiko Momose, Hachioji; Toshiaki Takahashi, Hino, and Yasushi Hoshino, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1981, Ser. No. 281,890

Claims priority, application Japan, Jul. 15, 1980, 55-97331; Jul. 21, 1980, 55-99617; Jul. 21, 1980, 55-99618; Jul. 23, 1980, 55-101807; Jul. 30, 1980, 55-105608

Int. Cl.³ G01C *3/00*

U.S. Cl. 356—1 **6 Claims**



1. A range finder comprising:

(a) image forming means disposed fixedly with respect to an object;

(b) a semiconductor position detection element disposed at a position substantially corresponding to the image forming position of said image forming means;

(c) a semi-transparent mirror disposed between said image forming means and said object;

(d) a moving relecting mirror disposed so as to be spaced apart by a length of a basic line from said semi-transparent mirror;

(e) driving means for relatively moving an optical image formed by said moving reflecting mirror, said semi-transparent mirror and said image forming means on said semiconductor position detection element with respect to an optical image formed by said image forming means on said semiconductor position detection element through said semi-transparent reflecting mirror;

(f) light-interception means for temporarily intercepting a ray of light incident from said reflecting mirror to said semiconductor position detection element and memory means for temporarily storing only a signal representing an incident ray of light emanating from said object through said semi-transparent reflecting mirror during the interim while said ray of light from said reflecting mirror is intercepted; and

(g) an operation circuit for operating on the output signals of said semiconductor position detection element and said memory means for producing a distance signal representing the distance between said object and said image forming position of said image forming means.

4,441,811

APPARATUS AND METHOD FOR DETERMINING REFRACTIVE INDEX PROFILE IN A CYLINDRICAL ARTICLE

Cevdet Melezoglu, Corning, and David J. Smith, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

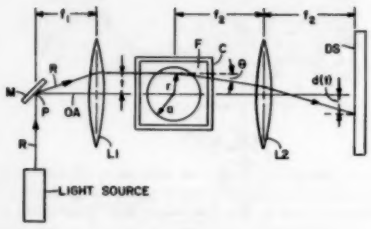
Filed Sep. 10, 1981, Ser. No. 300,796

Int. Cl.³ G01N *21/47*

U.S. Cl. 356—128 **2 Claims**

1. In optical apparatus for analyzing the optical characteristics of a transparent, cylindrical, radially symmetric article comprising source means for generating a narrow collimated beam of light along a path, rotatable reflecting means positioned at an interception point on the path for reflecting light

from the interception point over a range of selected angles in a scanning plane, support means for supporting the transparent cylindrical article in index-matching fluid at a fixed work station in the scanning plane such that the article intersects said plane at right angles thereto, first convergent refracting means L1 having focal length f_1 positioned between the reflecting means and the work station and on an optical axis joining the interception point and the cylinder axis of the article for directing light from the reflecting means through the cylindrical article, second convergent refracting means L2 of focal length f_2 positioned on the optical axis behind the article to refract the



light traversing the article, and displacement sensor means on the optical axis behind refractor L2 for intercepting the light refracted thereby, the improvement characterized in that:

the second convergent refractor L2 of focal length f_2 is positioned a distance f_2 from the cylinder axis of the article, with the displacement sensor being positioned a distance f_2 from the second convergent refractor L2, such that a displacement value d(t) output by the sensor, corresponding to the displacement from the optical axis at the sensor of a narrow light beam reaching the sensor from the source, corresponds exactly to the ray displacement function (t-y(t)) from the integral expression:

$$n(r) - n_c = \frac{n_c}{\pi L} \int_r^a \frac{(t - y(t))}{(t^2 - r^2)^{\frac{1}{2}}}\, dt$$

for calculating the refractive index profile of a cylindrical article.

4,441,812

METHOD AND APPARATUS FOR AUTOMATIC ALIGNMENT OF AN ANGLE-MEASURING INSTRUMENT

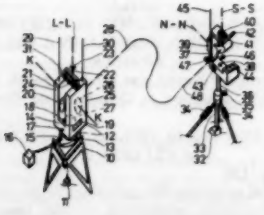
Wieland Feist, Jena-Lobeda, German Democratic Rep., assignor to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Oct. 30, 1981, Ser. No. 316,473

Claims priority, application German Democratic Rep., Dec. 24, 1980, 226659

Int. Cl.³ G01C *1/02*; G01B *11/26*

U.S. Cl. 356—147 **2 Claims**



1. A method for automatically aligning a geodetic angle-measuring device to a target point, comprising determining the target direction to the angle measuring device at the target point with respect to the north direction and the vertical direction, respectively, then determining the target direction from the angle measuring device to the target point from the results of the first mentioned determining step and then adjusting the angle measuring device, with respect to the horizontal angle and vertical angle, until it points to the target direction that has been determined in the second mentioned determining step.

4,441,813

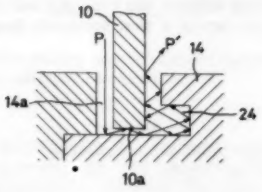
APPARATUS FOR DETECTING PINHOLES IN CANS

Kyuichi Shibasaki, and Hideo Kurashima, both of Yokosuka, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Mar. 10, 1981, Ser. No. 242,496

Int. Cl.³ G01N *21/90*

U.S. Cl. 356—237 **16 Claims**



1. Apparatus for detecting pinholes in cans comprising dark box means for excluding ambient light, said dark box means having an interior and a window communicating with said interior, light seal plate means disposed at said window and adapted to cooperate with the end of a can to attenuate passage of light between said can and said light seal plate means as the interior of said can communicates with the interior of said dark box means through said window, photodetector means in said dark box means for detecting light entering into the interior of said can through pinholes in said can and for producing an electrical signal, and light source means adapted to be disposed externally of said can for radiating light onto said can, said light seal plate means comprising receiving groove means defining a receiving groove adapted to receive the open end of said can, said receiving groove including a trap groove in communication with said receiving groove and operable to attenuate outside light entering said receiving groove and passing into the interior of said can.

4,441,814

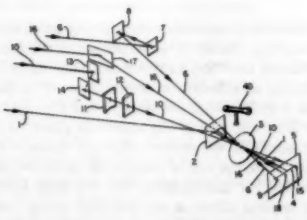
SPECTROGRAPH PROVIDING SPECTRAL REFERENCE MARKS

William T. Buchanan, 3518 Roswell Rd., Apt. C-6, Atlanta, Ga. 30305

Filed Sep. 28, 1981, Ser. No. 306,517

Int. Cl.³ G01J *3/18*

U.S. Cl. 356—305 **21 Claims**



1. In a spectrograph including means for dispersing a first

beam of light from a light source into spectral components along an axis of dispersion and means for focusing and recording said spectral components, the improvement comprising:

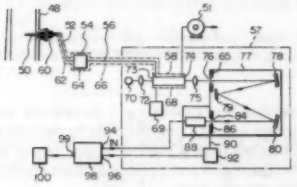
means for directing undispersed light of a second beam from said light source through said focusing means onto said recording means to record a reference mark approximately at a position along the axis of dispersion at which a first particular dispersed wavelength appears when present in the spectrum of said light source.

4,441,815

SELF-MODULATING SPECTROMETER

Takusuke Izumi, Tokyo, Japan, assignor to Anritsu Electric Company Limited, Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,735
Claims priority, application Japan, Mar. 31, 1981, 56-46263
Int. Cl.³ G01J *3/42*
U.S. Cl. 356—328 **20 Claims**



1. An apparatus for spectroscopic measurement of a concentration of a first substance which is present in a gas together with at least a second substance, said second substance having a characteristic absorption spectrum with a periodic spectrum structure and said first substance having a characteristic absorption spectrum which varies in a more gradual manner with respect to wavelength than does said characteristic absorption spectrum of said second substance, said apparatus comprising:

a light absorption cell for containing said gas incorporating said first and second substances;

a source of light, arranged to illuminate a portion of said light absorption cell;

an entrance slit plate having an entrance slit formed therein, said entrance slit being disposed such that a portion of light from said light source passes therethrough after having passed through said light absorption cell, said entrance slit having a slit width which is no greater than one half of the period of said periodic structure of said characteristic absorption spectrum of said second substance;

optical dispersion means disposed to resolve said light passed through said entrance slit into the spectra of said first and second substances;

an exit slit plate having a first exit slit formed therein, said first exit slit being disposed with respect to said optical dispersion means such that light of said resolved spectra which is within a predetermined range of wavelengths passes therethrough, said first exit slit having a slit width which is greater than one half of said period of said periodic structure of said second substance, and such that said first exit slit in conjunction with said entrance slit provide a trapezoidal slit function having a full-width which is within a range extending from a value substantialiy equal to said period of said periodic structure to a value which is one and one-half times said period of said periodic structure;

wavelength modulation means for modulating the wavelength of light passed through said first exit slit in a periodic manner at a predetermined modulation frequency, with the peak-to-peak amplitude of said wavelength modulation being substantially equal to a value which is $5/\pi$ times said period of said periodic structure;

photo-electric detection means disposed to be illuminated by said light passed through said first exit slit, and responsive to variations in the intensity thereof due to said modulation for producing a light intensity-modulated electrical signal;

signal processing circuit means comprising frequency-selective amplifier circuit means for selectively amplifying a component of said light intensity-modulated electrical signal corresponding to the second derivative of variation of said spectrum of said first substance with respect to wavelength, said second derivative signal component having a frequency of twice said modulation frequency, said frequency-selective amplifier circuit means being responsive to said second derivative signal component for producing an output signal having an amplitude value which is indicative of the concentration of said first substance in said gas; and

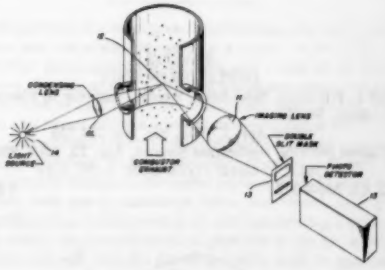
display means responsive to said output signal from said frequency-selective amplifier circuit means for providing an indication of said concentration of said first substance.

4,441,816

OPTICAL DOUBLE-SLIT PARTICLE MEASURING SYSTEM

Kenneth R. Hencken, Pleasanton; Daniel A. Tichenor, Freemont, and James C. F. Wang, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 25, 1982, Ser. No. 361,954
Int. Cl.³ G01N *15/02*
U.S. Cl. 356—335 **11 Claims**



4. A system for measuring the size of the particles in a certain size range moving along a path comprising:

(a) optical focusing means located between said path for forming an image and an image plane of a given particle moving along said path;

(b) a double-slit mask of opaque material located at the image plane of the optical focusing means, said double-slit mask having a first slit of a width equal to or larger than the largest particle of interest and a second slit spaced therefrom of a width equal to or smaller than the diameter of the smallest particle of interest;

and

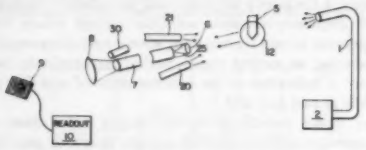
(c) a photodetector means disposed behind the double-slit mask and wherein the distance between said first and second slits is sufficient to cause said means to generate a double-pulsed output signal, a first pulse being related to the amount of light transmitted by said particle image through said first slit and a second pulse being related to the amount of light passing through said second slit.

4,441,817

ELECTRO-OPTICAL SENSORS WITH FIBER OPTIC BUNDLES

Timothy R. Pryor, Techmseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Filed Jul. 29, 1980, Ser. No. 173,370
Int. Cl.³ G01B *11/14*
U.S. Cl. 356—375 **59 Claims**



1. A method of determining the dimension, location, orientation, presence, or identity of at least a portion of an object comprising the steps of

imaging at least a portion of an object onto an end of a non-coherent optical fiber bundle whereby the image incident on said end of said fiber bundle is transmitted to the other end thereof;

transferring said image from said other end of said non-coherent optical fiber bundle onto a photodetector comprising a plurality of discrete photodetector elements;

determining, from the output of said photodetector elements, the area of the lighted or unlighted portion at the other end of said non-coherent optical fiber bundle; and

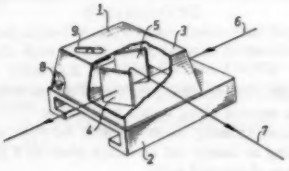
determining, from said area, said dimension, location, orientation, presence, or identity of at least said portion of said object.

4,441,818

DEFLECTION UNIT

Kjell J. Wickman, Stockholm, Sweden, assignor to Pharos AB, Lidingo, Sweden

Filed Apr. 7, 1981, Ser. No. 251,735
Claims priority, application Sweden, Apr. 23, 1980, 8003082
Int. Cl.³ G01B *11/26*; G01C *1/00, 9/34*
U.S. Cl. 356—372 **7 Claims**



1. A controllable light beam deflection apparatus for deflecting a light beam such that it travels in a predetermined measuring plane, comprising:

a beam deflection unit displaceable along a guide which extends substantially parallel to the light beam to be deflected, and

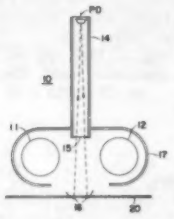
a level sensor comprising means for sensing the level deviation within a plane parallel to the measuring plane and along a line that bisects the angle between the beam to be deflected and the deflected beam for rotationally setting the deflection unit about an axis which is within a plane perpendicular to said measuring plane and perpendicular to said line.

4,441,819

CALIBRATION METHOD FOR PRINTING PLATE PICTURE PATTERN AREA METER

Hideo Takeuchi, Shirai; Satoru Horiguchi, Tsurugashima, and Ryuzo Tamaki, Sagamihara, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Oct. 15, 1981, Ser. No. 311,603
Claims priority, application Japan, Oct. 24, 1980, 55-149106; Oct. 24, 1980, 55-149107
Int. Cl.³ G01B *11/28*
U.S. Cl. 356—380 **2 Claims**



1. A method for calibrating a device for measuring the printing image area of a printing plate by detecting the quantity of light reflected from a plate detection region having a non-printing-image region and a printing image region, said method of calibrating comprising:

scanning a predetermined portion of said plate detection region a plurality of times to obtain a plurality of reflected light measurement values representing the measurement of a printing image area;

calculating a plurality of successive average values from said plurality of reflected light measurement values;

selecting a minimum value from among said average values which represents a measurement value from a printing image region of said detection region;

selecting a maximum value from among said average values which represents a measurement value from a non-printing-image region; and

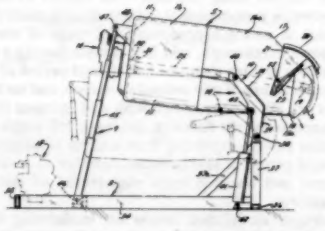
calibrating said device by modifying said measurement of a printing area with said maximum and minimum values.

4,441,820

CONCRETE MIX SURGE BIN

Glenway W. Maxon, III, Bayside, Wis., assignor to Maxon Industries, Inc., Milwaukee, Wis.

Filed Sep. 27, 1982, Ser. No. 423,784
Int. Cl.³ B01F *7/04*
U.S. Cl. 366—26 **6 Claims**



1. A surge bin for temporary storage of material such as concrete mix, into which a dump truck can charge material and from which the material can be intermittently discharged, said surge bin comprising a body having opposite side walls that converge towards a discharge outlet at a rear end of the body

and having an open top from its front end to near said discharge outlet, and an agitator in said body having an axis extending from front to rear thereof and rotatable in one direction about said axis to drive material in the body towards said discharge outlet, said surge bin being characterized by:

A. a substantially horizontal frame underlying the body and by which the body is supported;

B. a pair of lifting means, one near the front end of the body and the other near the rear end of it, each said lifting means having

(1) a lower pivotal connection with the frame, at a fixed location thereon, and

(2) an upper pivotal connection with the body, said pivotal connections having sidewardly extending axes, and said lifting means providing for vertical motion of both ends of the body in unison and alternatively for vertical motion of each end of the body relative to the other whereby the body is tilted; and

C. motion control means for controlling forward and rearward motion of the body,

(1) having a connection with the frame at a fixed location thereon, and

(2) having a pivotal connection with the body near one of its ends that defines a sidewardly extending axis about which the body can tilt.

4,441,821

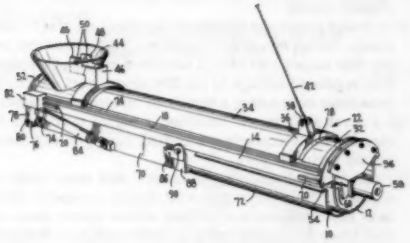
APPARATUS FOR INCREASING THE DELIVERY RANGE OF A MIXING AND DELIVERY AUGER TROUGH

George M. Burkhart, Strasburg, Pa., and Martin F. Dohnalik, Cortland, Ill., assignors to Barber-Greene Co., Aurora, Ill.

Filed Jul. 20, 1982, Ser. No. 400,140

Int. Cl.³ B28C *7/16*

U.S. Cl. 366—61 **9 Claims**



1. An improved apparatus for mixing and delivering individual stored components which are selectively dispensed for delivery as a mixture, said apparatus comprising:

mixing means for receiving the dispensed ingredients, said mixing means comprising: an elongated trough having an inlet end and a discharge end; a rotatably driven auger disposed in said trough for transporting the dispensed ingredients from said inlet end to said discharge end while mixing the dispensed ingredients in transit; and drive means for selectively rotating said auger;

first and second elongated conveyor chutes, each having an ingress end and an egress end;

pivot means securing said egress end of said first chute to said ingress end of said second chute;

mounting means slidably securing said first chute to said trough for longitudinal slidable movement relative to said trough in longitudinally aligned end-to-end relation beneath the trough and in which free fall of the mixed ingredients from said discharge end of said trough is unimpeded by said first and second chutes, and a deployed position in which the ingress end of said first chute is disposed below said discharge end of said trough to receive mixed ingredients falling from said discharge end; and

wherein pivot means includes further means permitting selective pivotal motion of said second chute relative to said first chute in said deployed position, said pivotal motion extending between first and second mutual orientations, said first and second chutes in said first orientation being disposed in longitudinal alignment, with the egress end of said first chute adjacent the ingress end of said second chute to permit free flow of mixed material from said first chute to said second chute, said second chute in said second orientation being positioned out of longitudinal alignment with said first chute to permit free fall of mixed ingredients from the egress end of said first chute.

4,441,822

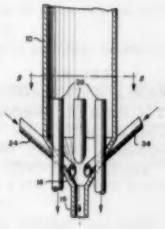
APPARATUS FOR MIXING AND DISTRIBUTING SOLID PARTICULATE MATERIAL

Bimal K. Biswas, East Orange, and Joseph E. Kochie, Carteret, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Division of Ser. No. 183,781, Sep. 3, 1980, abandoned. This application May 10, 1982, Ser. No. 376,644

Int. Cl.³ B01F *13/02*

U.S. Cl. 366—101 **18 Claims**



1. An apparatus for mixing and distributing solid particulate material, said apparatus comprising a vessel, a plurality of spaced inlet pipes extending through said vessel at an angle relative to the axis of said vessel and communicating with the lower portion of said vessel for introducing particulate material into said vessel to form a bed of material, means for introducing a pressurized gas into the lower portion of said vessel at a velocity sufficient to pass upwardly through said bed of material, means formed in the upper portion of said vessel for permitting said gas to discharge from said vessel, said gas passing through a central portion of said bed creating a central zone in which the concentration of particles in the gas is relatively low and said particles move upwardly with the gas, and an outer zone surrounding said central zone in which the concentration of said particles is relatively high and their general movement is downwardly, and a plurality of pipes communicating with corresponding portions of said outer zone in a common plane and extending from said outer zone, through said vessel and to an area external of said vessel, said pipes disposed in a spaced relation around said vessel and parallel to the axis of said vessel with their inlet ends extending above the discharge ends of said inlet pipes for permitting said material to discharge from a plurality of areas of said bed.

4,441,823

STATIC LINE MIXER

Harold H. Power, 65 Five Field Rd., Madison, Conn. 06443

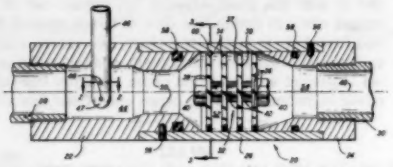
Filed Jul. 19, 1982, Ser. No. 399,959

Int. Cl.³ B01F *5/06*

U.S. Cl. 366—167 **10 Claims**

1. A liquid mixer for dispersing a second fluid into a first fluid comprised of a body having a chamber with a longitudinal axis, the chamber having a flow path for the flow of a comingled first fluid and second fluid therethrough along said

axis; a plurality of orifice plates spaced apart along said axis and fixedly held within the chamber; each orifice plate having an upstream face, a downstream face and a multiplicity of slot passages connecting the faces; each slot passage having a



length L and a through-plate length D, both lengths at least two times the width T of the slot passages; and each slot passage shaped to discharge fluid at an angle of 30–60 degrees to the downstream face of the orifice plate.

4,441,824

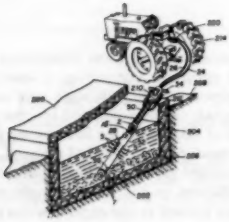
PORTABLE WASTE AGITATOR

Kim C. Brokaw, 701 N. Birch St., Monticello, Iowa 52310

Continuation of Ser. No. 286,147, Jul. 23, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 521,513

Int. Cl.³ B01F *5/12*

U.S. Cl. 366—266 **11 Claims**



1. Portable apparatus for agitation of waste solids within a livestock confinement facility collection pit, comprising

a portable elongated tubular housing having a first end and a second end

a plurality of bars extending from the first end of said housing,

a top plate mounted to the ends of said bars,

a propulsion member mounted within said housing,

a hydraulic piston motor mounted within said housing adjacent to the first end thereof,

said propulsion member comprising

a driven shaft depending from said motor,

screw flighting mounted to said driven shaft along a portion thereof,

impeller blades mounted to said shaft,

a plurality of openings along said housing from the first end thereof to a point midway along said housing,

an opening in the sidewall of said housing adjacent the impeller portion of said propulsion member,

an end cap on the second end of said housing,

a plurality of fluid conducting members interconnecting said motor and said top plate,

a plurality of fluid conducting interconnectors mounted in said top plate and passing therethrough.

4,441,825

LOW-POWER INTEGRATED CIRCUIT FOR AN ELECTRONIC TIMEPIECE

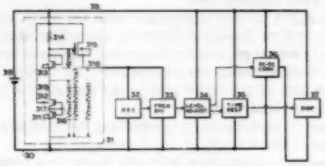
Shigeru Morokawa, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 721,440, Sep. 8, 1976, abandoned. This application Aug. 4, 1978, Ser. No. 931,277

Claims priority, application Japan, Sep. 8, 1975, 50-108629

Int. Cl.³ G04B *1/00*

U.S. Cl. 368—204 **9 Claims**



1. An electronic timepiece comprising:

(a) a time reference signal source for generating a time reference signal;

(b) a time count unit signal synthesizing means for synthesizing a time count unit signal from said time reference signal;

(c) a time keep means for synthesizing a time keep signal from said time count unit signal;

(d) a time display means for displaying a time information in response to said time keep signal from said time keep means;

(e) a power source for applying electric energy to a first circuit part including said time reference signal source and said time unit signal synthesizing means and to a second circuit part including said time keep means and said time display means;

(f) a device parameter dependent regulated constant voltage source circuit means for connecting said power source to the first circuit part of said timepiece and for providing a first regulated voltage to the first circuit part, said device parameter comprising a threshold voltage of a transistor;

(g) a level shift means receiving a signal from said first circuit part and sending a shifted signal to said second circuit part; and

(h) said time reference signal source, said time count unit signal synthesizing means, said device parameter dependent regulated constant voltage source circuit means and said level shift means being incorporated in an integrated circuit.

4,441,826

ELECTRONIC TIMEPIECE

Shigeru Morokawa, Tokyo, and Keiichiro Koga, Tokorozawa, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Division of Ser. No. 269,297, Jun. 1, 1981, abandoned, which is a division of Ser. No. 1,260, Jan. 5, 1979, Pat. No. 4,298,971. This application Sep. 30, 1982, Ser. No. 430,569

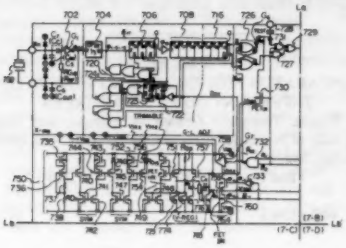
Claims priority, application Japan, Jan. 11, 1978, 53-1751

Int. Cl.³ G04B *1/00*; H03K *3/01*; G05F *1/56*

U.S. Cl. 368—204 **3 Claims**

1. An electronic timepiece powered by a battery and having display means for indicating time, comprising an integrated circuit chip including a standard frequency signal source for generating a signal of relatively high frequency, frequency divider means responsive to said signal of relatively high frequency for producing a relatively low frequency signal, and drive signal generator means responsive to said relatively low frequency signal for producing drive signals, said integrated circuit chip also including reference voltage circuit means composed of current mirror circuit means to provide a stabilized current and a plurality of voltage stabilizer circuit means

responsive to said stabilized current to provide a reference voltage, and constant voltage circuit means including a differ-



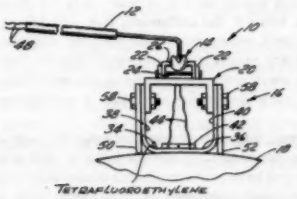
ential amplifier responsive to said reference voltage and source grounded driving transistor means connected to said differential amplifier to provide a constant voltage.

4,441,827

TRAVELLING SURFACE TEMPERATURE PROBE

Andre Coderre, 15964 Perreault St., Pierrefonds, Quebec H9H 1N3, Canada

Filed Oct. 14, 1980, Ser. No. 196,535
Int. Cl.³ G01K *13/08, 1/14*
U.S. Cl. 374—153 **5 Claims**



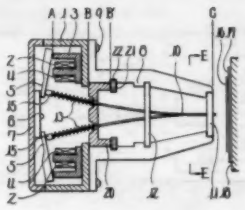
1. A temperature probe adapted to sense the temperature of a surface travelling relative to said probe comprising; a support member having a pair of spaced apart arms, a bridging section formed from flexible sheet material mounted from said arms and bridging across the space between said arms and having a contact face adapted to contact said surface being sensed over a contacting portion of its area and an opposite face facing the space between said arms, said contacting portion being spaced from said arms, a sensor element in said space between said arms in close thermal contact with said opposite face in an area of said opposite face directly opposite said contacting portion; said sensor element being spaced from said support member, said flexible sheet material having a low coefficient of friction between said contacting portion and said surface travelling relative to said probe and a thickness and a thermal conductivity coordinated so that heat generated by contact between said sheet material and said surface does not materially affect the temperature of said sensor element and a temperature differential of up to 20° F. on said surface is detectable by said sensor element in less than 30 seconds.

4,441,828

PRINTING HEAD OF DOT PRINTER

Kuniaki Ochiai; Masami Horii, and Osamu Aoki, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,649
Claims priority, application Japan, Dec. 5, 1980, 55-171852; Feb. 16, 1981, 56-21676
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **6 Claims**



1. A printing head of a dot printer, comprising:
a support member;
a plurality of needle members located in said support member;
a guide holder connected to said support member and including a groove and a stepped portion;
a stop member engageable in said groove;
a plurality of electromagnets mounted in said support member and each of which further comprises a stopper and an armature with a reset position thereof being determined by said stopper;
a needle guide for guiding said needle members driven by said armatures and wherein said needle guide is operatively associated with an end portion of said guide holder; and
a common spring support for supporting one end of each of said needle springs and for urging the needle members in a reset direction wherein said spring support is located at a rear side of said guide holder after assembly and wherein said spring support is positioned in said guide holder so as to be movable forward to a front position defined by said stepped portion or backward during assembly with respect to the guide holder so as to avoid contact of said armature and stopper with said needle springs during assembly and is fixedly installed at a predetermined rear position within said support member after assembly by said stop member engaged in said groove.

4,441,829

METHOD FOR PERFORMING A MULTIPLE PAGE GET OPERATION IN A TEXT PROCESSING SYSTEM

Raymond A. Hebert, Jr.; Lewis J. Levine, and Kenneth O. Shipp, Jr., all of Austin, Tex., assignors to International Business Machines, Armonk, N.Y.

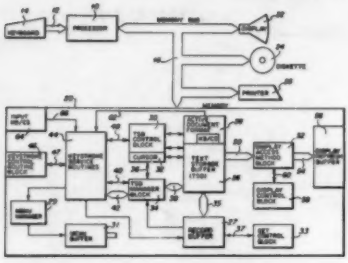
Filed Sep. 24, 1981, Ser. No. 305,253
Int. Cl.³ B41J *3/46*
U.S. Cl. 400—63 **4 Claims**

1. In an interactive text processing system which includes a keyboard and a display unit and in which a document input by way of a keyboard is stored, displayed to an operator, and further processed in accordance with directions supplied to said system by an operator interacting with the keyboard and display unit, an improved method for copying one or more pages of text into a document from another part of the same document or from a different document, said method comprising:
displaying to the operator the document into which one or more pages of text data is to be copied;

signalling to the system the location within said document into which the text data is to be copied;

specifying to the system the identification and location of said text data;

scanning said specified text data for data control instructions contained within said specified text data specifying added text data to be included within said specified text data;



adding said specified added text data to said specified text data prior to copying said specified text data into said document; and

copying said specified text data as modified by said added text data into said document at the signalled location to provide a revised document.

4,441,830

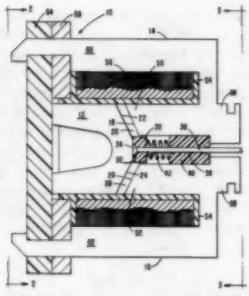
PRINTING SOLENOID

Victor J. Italiano, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 29, 1982, Ser. No. 363,361

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **3 Claims**



1. A print wire actuating device of generally rectangular construction comprising a

pair of spaced flat irregular-shaped electromagnetic pole pieces, each pole piece having a first portion and a second portion, an

electromagnetic coil operably associated with said pole pieces, a

plunger defining inclined surfaces on one end thereof and positioned in the same plane with said pole pieces and spaced from the first portion of each pole piece to provide an air gap between the surfaces of the plunger and the first portions and movable in said plane toward the first portions upon energization of said electromagnetic coil, a

print wire disposed between said pole pieces and abutting said plunger and slidably operated thereby,

resilient means for biasing said print wire and said plunger in one direction, and a

flat rectangular apertured member for receiving said plunger and the second portion of each pole piece for securing the parts of the actuating device and positioned in relation to said coil and said plunger for providing a path for magnetic flux generated in response to energization of said coil.

4,441,831

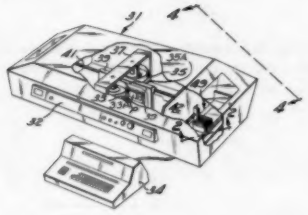
APPARATUS FOR EMBOSSING PLATES OF DIFFERENT SIZES AND SHAPES

Neil A. Tipple, Torrance; Jerome W. Gibson, and Ronald J. Boyd, both of Northridge, all of Calif., assignors to DBS, Inc., Randolph, Mass.

Filed Apr. 4, 1980, Ser. No. 137,216

Int. Cl.³ B41J *1/22*

U.S. Cl. 400—134.3 **39 Claims**



1. In an embossing machine having embossing elements located to operate on a planar workpiece at an embossing site, frame means shiftable in a plane at the embossing site to present various areas of the workpiece sequentially to the embossing elements to receive successive embossed impressions, and means for feeding workpieces to the embossing site for embossment and away from the embossing site for accumulation after embossment wherein said feeding means comprises:

first track means having opposed rails on said frame means for supporting a workpiece by parallel edges during embossment;

inlet track means having opposed rails for guiding a workpiece toward the embossing site, and aligned with said first track means for transferring the workpiece thereto:

outlet track means having opposed rails for guiding a workpiece away from the embossing site and aligned with said first track means for accepting a workpiece therefrom; and

means mounting at least one corresponding rail of each track means for ready adjustment towards and away from the other rail to permit convenient adaption of the machine to feeding and embossing of workpieces with substantially different dimensions transversely of their direction of travel through the machine via the track means.

4,441,832

ADAPTIVE HIGH SPEED SERIAL PRINTER

Masahisa Narita, Kodaira, and Osamu Tomita, Ebina, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 24, 1982, Ser. No. 361,542

Claims priority, application Japan, Mar. 30, 1981, 56-47108

Int. Cl.³ B41J *1/30, 3/54*

U.S. Cl. 400—144.2 **11 Claims**

1. An adaptive high speed serial printer operatively connected to an external source having a selection amount data, for printing on a record media, comprising:

a platen for supporting the record media;

a carrier for traversing back and forth along said platen;

a printing wheel, selected from a plurality of printing wheels, mounted on said carrier, said printing wheel having a plurality of type elements;

selecting means, mounted on said carrier, for moving a

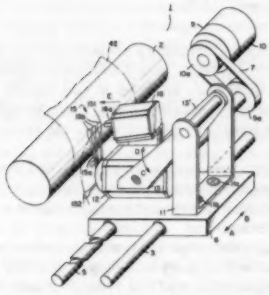
selected one of said plurality of type elements to a hammering position located in front of said platen by rotating said printing wheel;

hammering means for impacting said selected one of said plurality of type elements with said platen;

spacing means, coupled to said carrier, for correctly spacing said carrier along said platen at a spacing speed in dependence upon a command signal; and

control means, operatively connected to receive the selection amount data from the external source, comprising:

selecting control means for controlling the movement of said selecting means so as to rotate said selected one of said plurality of type elements to the hammering position between said hammering means and said platen in accordance with the selection amount data which indicates the distance from the present position of said



selected one of said plurality of type elements to said hammering position;

hammer control means, connected to said hammering means, for controlling the impact timing of said hammering means;

signal generating means for generating a signal corresponding to the inertia of said printing wheel, selected from said plurality of printing wheels, mounted on said carrier; and

carrier control means, operatively connected to said signal generating means, said spacing means and the external source, for generating the command signal for controlling the spacing speed of said carrier as it moves along said platen, the command signal being generated in accordance with the selection amount data and the signal corresponding to the inertia of said printing wheel.

4,441,833

KEYBOARD ACTUATOR

Ralph D. Hasenbalg, 8635 Rudnick Ave., Canoga Park, Calif. 91304

Filed Oct. 13, 1981, Ser. No. 310,850
Int. Cl.³ B41J *23/22*; F15B *15/26*
U.S. Cl. 400—180 **18 Claims**

10. A method for controllably actuating selected keys of a keyboard-operated apparatus in response to signals from control means comprising the steps of

supporting a plurality of latching fluid actuators adapted to be associated with respective keys of a keyboard-operated apparatus,

communicating a first fluid pressure from a first in response to the control means signals to release latch means within the selected latching fluid actuators, and

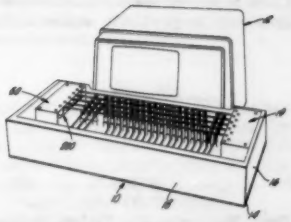
communicating a second fluid pressure from a second valve means independent of the first valve means to one or more selected latching fluid actuators in response to the control means signals to provide drive fluid pressure to piston means within the selected latching fluid actuators, whereby each latching fluid actuator associated with each selected key selectively receives both the first fluid pressure from the first valve means and the second fluid pressure from the second valve means to unlatch the piston means and to drive the piston means to actuate the selected key of the keyboard with which it is associated.

12. A latching fluid actuator comprising

a cylinder closed at one end and a piston member sealably carried within the cylinder, the piston member including a piston rod and engagement means,

first fluid inlet means for providing fluid communication through the cylinder closed end,

a latch element having a first member and a second member



disposed on opposite sides of the piston rod and a third member interconnecting the first and second members,

a fluid responsive diaphragm member acting against one of the first or second members of the latch element,

second fluid inlet means for providing fluid communication to the fluid responsive member said second fluid inlet means providing a fluid communication independent of the fluid communication to the first fluid inlet means, and

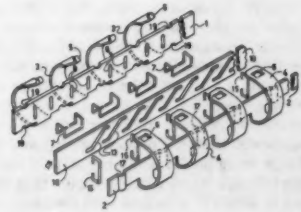
spring means for applying biasing force against the other of the first or second members of the latch element, the second member being adapted to engage the piston member engagement means, the engagement means being for receiving the second member to prevent piston member displacement.

4,441,834

LOOSE LEAF BINDER

Claudio B. Cardellini, Rua Manuel Maria Tourinho, 673, 01236 Sao Paulo SP, Brazil

Continuation-in-part of Ser. No. 127,544, Mar. 6, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,366
Claims priority, application Brazil, Mar. 13, 1979, 7901568
Int. Cl.³ B42F *13/22*
U.S. Cl. 402—55 **6 Claims**



1. A loose leaf binder comprising:

a pair of elongated strips each having a plurality of half loops joined to an edge thereof at corresponding spaced locations along said edge, the ends of said half loops being arranged so as to form full loops when the strips are positioned in juxtaposition;

a plurality of clip means hingedly interconnecting said strips;

means provided on one of said strips for permitting movement of said clip means transversely of said strip;

an actuator interposed between said strips in movable relationship thereto, said actuator having a plurality of parallel inclined slots located intermediate its edges and adapted to receive said clip means whereby when said actuator is moved in a direction longitudinally of said elongated strips, movement of the clip means within said slots displaces the clip means transversely of said one strip and engages an edge of the other strip thereby moving said other strip to separate its half loops from the half loops of said one strip; and

additional clip means operatively related to said strips and the actuator to prevent transverse movement of the actuator relative to one of said strips while permitting the actuator to move longitudinally relative to the strips.

4,441,835

PIVOT JOINTS

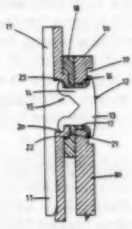
Ronald P. Davis, Wellington, New Zealand, assignor to Interlock Industries Limited, Wellington, New Zealand

Filed Mar. 11, 1982, Ser. No. 357,194

Claims priority, application New Zealand, Mar. 12, 1981, 196479

Int. Cl.³ F16B *19/00*

U.S. Cl. 403—24 **11 Claims**



1. A friction pivot joint between two components, said joint being of the type in which a first of the components has an opening through which the shank of a headed fastening extends, the tail of said shank extending through an axially aligned opening in the second of the components, the tail of said shank having means to prevent axial movement of said fastening relative to said components, the joint being characterised in that the shank of the fastening extends through a bushing of wear-resistant plastics material located in the opening in the first component, said bushing having integrally formed therewith a peripheral flange, said flange being sandwiched between said first and second components thereby preventing contact between the components, friction in said joint being created from the plastics bushing and integral peripheral flange being placed under pressure by said fastening, said bushing having a length which is greater than the length of the opening in which it is located with the result that during assembly of the joint pressure created by said fastening causes the free end of the bushing to flow under the head of the fastening to be retained thereunder by a concave underside of the head of the fastening, said head and shank of the fastening thereby being prevented from contacting said first component so that during relative pivotal movement of said components substantially no torque is applied to the shank by the head of the fastening.

4,441,836

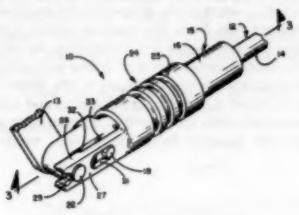
CABLE CONNECTION

James C. Boda, Winneconne, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 2, 1982, Ser. No. 414,118

Int. Cl.³ F16C *1/14*

U.S. Cl. 403—154 **5 Claims**



1. A connector for attaching a central core wire of a flexible cable to a control element, said connector comprising:

(A) a cylindrical body attached to said flexible cable, said cylindrical body including a hole therethrough, said hole extending generally perpendicular to the axis of said cylinder;

(B) a connecting pin having one end attached to said control element, said connecting pin extending through said hole in said cylindrical body and having a shoulder facing said control element; and

(C) a locking body reciprocably mounted on said cylindrical body, said locking body including a generally cylindrical portion mounted around said cylindrical body and having a surface engageable with said shoulder of said connecting pin on the side of said cylindrical body opposite said control element, to prevent removal of said pin from said hole.

4,441,837

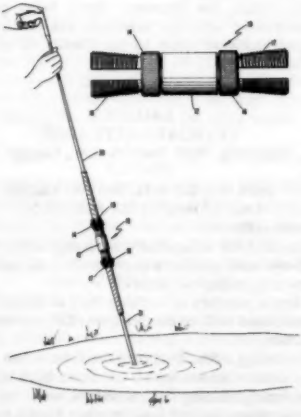
GOLF CLUB COUPLING ASSEMBLY

Joseph Mastroni, 462 W. Fairway Cir., Mesa, Ariz. 85201

Filed Sep. 4, 1981, Ser. No. 299,425

Int. Cl.³ B25G *3/00*; F16B *7/18*; F16D *1/00*; F16L *15/00*

U.S. Cl. 403—300 **11 Claims**



1. A coupling assembly for joining the tapered grip ends of two golf clubs to form a golf ball retrieving device, said assembly comprising:

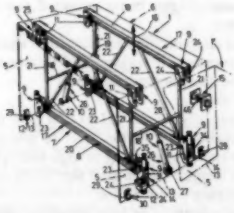
(a) a housing portion and gripping portions disposed along a longitudinal axis,
(b) a housing portion having first and second handle receiving ends,
(c) a gripping portion being disposed adjacent each of the receiving ends and being in open communication with the respective adjacent receiving end, and
(d) tightening means mounted to cause each of the gripping portions to operate between an open position and a contracted, gripping position,
(e) said gripping portions being effective to receive the tapered handle end of a golf club when in the open position and being effective to tightly grip the tapered handle end of said golf club when in the contracted, gripping position,
(f) each gripping portion includes at least two gripping sections laterally spaced with respect to each other and having a structural configuration effective to cause the gripping sections to move toward one another when the gripping portion is in the contracted, gripping position,
(g) each gripping portion including a threaded outer surface on each of the gripping sections, and
(h) the tightening means includes a tightening member having a portion which threadingly engages the threaded outer surface of the gripping sections,
(i) said tightening member being effective to move along the longitudinal axis of the assembly in a direction away from the housing portion outwardly along each of the gripping portions to cause the gripping portion to move from an open position to said contracted, gripping position when the tapered handle end of a golf club is disposed between the spaced gripping sections,
(j) said gripping sections have a cross-sectional thickness which increases along the longitudinal axis of the assembly in a direction away from the housing portion to form a tapered bore within the gripping portions which engage the tapered grip ends of the golf club when the gripping portion is in the contracted, gripping position.

4,441,838

ELEMENT FOR TUNNEL-TYPE METAL SHUTTERING

Alain M. Cossart, Paris, France, assignor to Metalex, Paris, France

Filed Jan. 3, 1983, Ser. No. 455,023
Int. Cl.³ E21D *19/04*; B28B *7/02*
U.S. Cl. 405—150 **11 Claims**



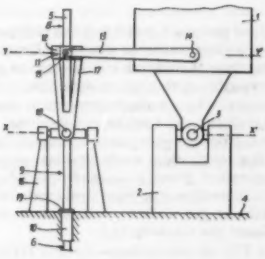
1. Element from tunnel-type metal shuttering, particularly retractable element for shuttering and unshuttering cells from buildings with bearing cross-walls and solid concrete slab, comprising two vertical panels joined together by a flexible plating, means to retain said panels in parallel relationship and to vary the spacing thereof to bring said plating to a horizontal shuttering position or to a concave unshuttering position, said means being comprised of a rigid and undistortable structure extending between the element panels, guides secured to said panels and bearing said structure, and means bearing on the panels and structure to move said structure in parallel relationship therewith along a vertical direction, between two end positions corresponding to the shuttering position in which said structure bears the plating in horizontal position and the unshuttering position of said element, said guides having that portion thereof which cooperates with the structure lying at an angle to the panels in such a way that the slanting of those guide portions secured to the one panel be opposite to the slanting of the guides secured to the other panel, in such a way that the structure as it moves relative to the panels from the one end position to the other one, causes the spacing between said panels to vary, rolling means associated with each said panels adjacent the bottom thereof, to allow moving said element to the unshuttering position, and means associated with each panel adjacent the bottom thereof and controlled by the rigid structure as it is moved between both end positions thereof, to adjust the panel bottom position and the rolling means position relative to the ground, while insuring automatic levelling of the element in the shuttering position thereof, and means to join each panel from an element to the directly adjacent parallel panel from an element lying side by side when said element lie in shuttering position.

4,441,839

ECCENTRIC FLUID DELIVERY COLUMN FOR ARTICULATED DRILLING PLATFORM IN DEEP WATER PETROLEUM PRODUCTION

Francois Baduel, Tarbes; Christian Dumazy, Idron, and Jean-Paul Sarrailh, Pau, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Sep. 17, 1982, Ser. No. 419,448
Claims priority, application France, Sep. 18, 1981, 81 17642
Int. Cl.³ E02B *17/02*
U.S. Cl. 405—202 **7 Claims**



1. A delivery column for a deep-water well structure for communicating with a region beneath the water bottom, said structure having a vertical axis, said structure resting on a first base and articulated with respect thereto about a first axis, said column containing a plurality of pipes connected to each other end to end, comprising an upper tubular part rising near the surface of the water, and a lower tubing member connected at one end to a base pipe by means of a disconnecting coupler and at the other end to the lower end of the lower tubing member of the column by means of a coaxial union of a piston mounted for longitudinal sliding movement in a generally cylindrical seat wherein said seat **12** is connected:

at one end to the structure by means of a first arm articulated at each of its ends, the axis of one end articulation coinciding with the axis of the structure, and the axis of the other end articulation coinciding with the axis of the column, the axes of both articulations being perpendicular to the plane defined by the axis of the structure and the axis of the column;

at the other end to a second base by means of a second arm extending from the seat and coupled to said second base by means of a universal joint, the center of said joint being situated horizontally adjacent the axis of articulation of the structure on the base thereof, the center of the universal joint lying on a vertical center line of the base housing of the lower tubing member;

said second arm being such that the axis of the seat passes through the center of the universal joint,

the centers of articulation of said structure on the base thereof and of the universal joint and the centers of the two end articulations of the first arm forming the vertices of a parallelogram.

4,441,840

PROCESS FOR THE DISPOSAL AND ECONOMIC USE OF THE RESIDUE OF THE EXHAUST GAS WASHERS OF FURNACES IN RELATION TO WASTE PRODUCTS

Friedrich Bassier, Duisburg, and Klaus Goldschmidt, Essen, both of Fed. Rep. of Germany, assignors to Ruhrkohle AG and Steag AG, both of Essen, Fed. Rep. of Germany

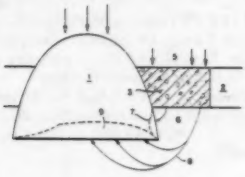
Filed Jun. 6, 1980, Ser. No. 156,933

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, 2923545

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.³ E02D *3/14*

U.S. Cl. 405—267 **7 Claims**



1. An improved process for utilizing the residues of a thermal energy power plant washer in which the limestone or lime residue resulting from the washer is converted to gypsum, the substrate is recrystallized to alpha sulfate hemihydrate and is treated with water, wherein the improvement comprises the step of mixing with the alpha sulfate hemihydrate, at least one additive selected from the group consistency of flue ash from a coal combustion installation, waste washings or local tailings from coal recuperation, granulate of ash from coal combustion, slag from coal combustion, slag from steel production, calcium sulfate from exhaust gas washers, and calcium sulfate dehydrate from exhaust gas washers.

4,441,841

THROW AWAY INSERT

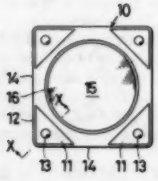
Yoshikatsu Mori, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 242,903, Mar. 12, 1981, abandoned, which is a continuation of Ser. No. 81,259, Oct. 2, 1979, abandoned. This application Feb. 2, 1982, Ser. No. 344,931

Claims priority, application Japan, Nov. 6, 1978, 53-138523

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—114 **1 Claim**



1. A throw away insert for a boring tool, said insert having a polygonal shape with corners and having two opposite, parallel surfaces and a plurality of sides, a cutting edge formed at the junction of each of said sides with at least one of said surfaces, said one surface having a land extending inside of and along said cutting edge, said insert having a plurality of separate recesses in said one surface inside of said land, one recess at each corner of the insert, a substantially circular first chip breaking projection in the central portion of each recess with a periphery spaced from the edges of the recess, and a second chip breaking projection at the center of said one surface and having the outer periphery thereof extending substantially closer to said cutting edge between each pair of the corners of the insert than at the corners, the top of said first chip breaking projection being below the top of said second chip projection.

4,441,842

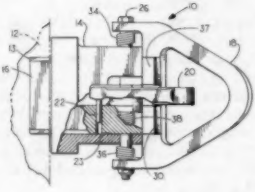
FOOT ACTUATED LATCH

Jeffrey P. Kosmoski, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 5, 1981, Ser. No. 318,474

Int. Cl.³ B60P *1/64, 7/13;* B61D *45/00*

U.S. Cl. 410—81 **5 Claims**



1. A foot actuated latch for use in securing a container in position on the cargo floor of an aircraft comprising:

a base member including:

a slot;

a tongue slidably positioned in said slot, said tongue having;

a first end adapted to engage a container,

an opposite second end;

an abutment surface therebetween;

an extended container engaging position; and

a retracted container releasing position;

a lock lever having:

a first end hingedly connected to said base member;

an abutment finger;

lock lever bias means acting to urge said abutment finger into engagement with said tongue abutment surface to maintain said tongue in its retracted container release position; and

a second end adapted for foot actuation against said lock lever bias means to disengage said abutment finger from said tongue abutment surface; and

a release lever having:

a first end hingedly connected to said base member;

means connecting said release lever to said tongue;

release lever bias means acting to urge said release lever to move said tongue within said slot to its extended container engaging position; and

a second end adapted for foot actuation against said release lever bias means to move said tongue to its retracted container release position.

4,441,843

ADJUSTABLE QUARTER-TURN FASTENER

Andrew C. W. Wright, Farnham, and John W. Petruschke, Aldershot, both of England, assignors to Dzus Fastener Co., Inc., West Islip, N.Y.

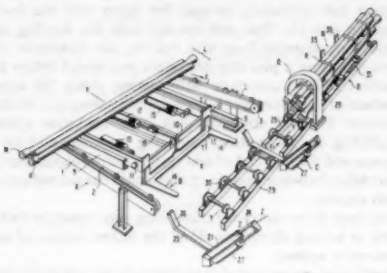
Filed Nov. 23, 1981, Ser. No. 323,815

Int. Cl.³ F16B *21/02*

U.S. Cl. 411—349 **4 Claims**

1. A quarter-turn fastener for fastening a panel to a support, said fastener comprising a bolt, the bolt having a head and a screw-threaded shank; a retainer assembly including a bush

having a sliding fit on said shank with a counterbore formed therein and having a nut permanently and non-rotatably retained in said counterbore with a tight frictional screw fit with the screw-threaded shank; a pair of abutments on said bush for engaging the rear of said support, said support having an aperture in which said bush locates; at least one pair of stops on said



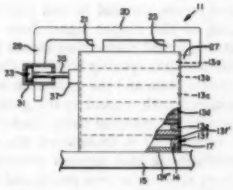
bush for engagement with the sides of said aperture in said support or a corresponding aperture in said panel to define inoperative and operative positions of said retainer assembly, wherein a compression spring is located between said retainer assembly and said panel to retain said retainer assembly in said inoperative position on said panel, under the action of friction, when said retainer assembly is disengaged from said support.

4,441,844

PORTABLE PANEL SEPARATION DEVICE

Curtis D. Miller, 24203 NE. Oregon St., Troutdale, Oreg. 97060

Filed Apr. 12, 1982, Ser. No. 367,464
Int. Cl.³ B65G *59/02*
U.S. Cl. 414—117 **3 Claims**



1. A portable separator device comprising a beam to span a stack of panels to be separated,

a pair of feet means carried by the beam in spaced relation therealong to adapt the device to be supported solely by contact with the top of such stack at spaced places thereon,

a stop member carried by the beam at one end for disposition at one side of the stack,

a power unit carried by the beam at the other end thereof and having a stack engaging member for disposition at the opposite side of the stack,

said feet means acting as depth guides to vertically dispose said stop member at a level even with the associated edge of the uppermost panel, and to vertically dispose said stack engaging member below the just mentioned level,

and means to facilitate actuation of said power unit to cause it to bodily shift said beam horizontally relative to the stack and carry the uppermost panel with it,

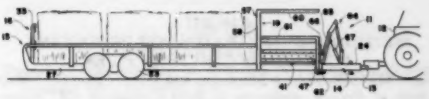
at least one of said feet means being mounted for adjustable movement along said beam.

4,441,845

BALE HANDLING APPARATUS

David W. Gibson, P.O. Box 117, Springdale, Mont. 59082

Continuation-in-part of Ser. No. 287,285, Jul. 27, 1981, Pat. No. 4,376,607. This application Mar. 10, 1983, Ser. No. 474,256
Int. Cl.³ A01D *87/12*
U.S. Cl. 414—24.6 **17 Claims**



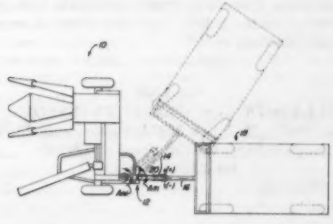
1. Bale handling apparatus including a base portion, a bale storing portion, a bale moving portion, a bale distributing portion, a bale loading portion and a control portion; said base portion including a frame section, wheeled carriage means supporting said frame section, a hitch member disposed at one end of said frame section; said bale storing portion including a bale supporting section disposed on said frame section, said bale supporting section extending from the rear end of said frame section remote from said hitch member toward but spaced from said hitch member, side rail sections extending upwardly from longitudinal edges of said bale supporting section; said bale moving portion including a transverse rear rail section disposed between said side rail sections, said rear rail section being movable from the rear end of said bale supporting section to the front end thereof; said bale distributing portion being disposed on said frame section between said hitch member and said bale storing portion, said bale distributing portion including a frame, bale rotating means mounted on said frame, said bale rotating means being oriented transversely of said bale storing portion; said bale loading portion being disposed adjacent to said bale distributing portion for loading a bale onto said bale distributing portion; said control portion including means for moving said rear rail section toward said bale distributing portion, and means for driving said bale rotating means; whereby bales positioned on said bale storing portion are advanced sequentially to said bale distributing portion and material distributed therefrom.

4,441,846

AUTO SPOUT AIMER WITH DELAY

Stanley J. Johnson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 9, 1982, Ser. No. 347,125
Int. Cl.³ B65G *67/22*
U.S. Cl. 414—335 **6 Claims**



1. In a machine including a crop discharge spout on an agricultural machine, a crop-receiving wagon pivotally attached to the machine and a control system for maintaining predetermined spout-wagon angular relationships, the control system having a first and second operational mode wherein the spout-wagon angular relationship is maintained within first and second angular ranges during first and second ranges of wagon-machine angles, and having means for switching from one

to the other of the operational modes when the wagon-machine angle changes from one to other of the wagon-machine angle ranges; the improvement comprising:

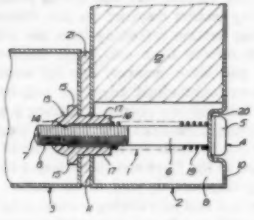
timer means for delaying the switching between operational modes for a predetermined delay time period after the wagon-machine changes from one to the other of the wagon-machine angle ranges.

4,441,847

METHOD AND APPARATUS FOR PRODUCING BUNDLES OF CAST IRON PIPES

Roger Malivoir, Pont a Mousson, and Gilbert Mayer, Nancy, both of France, assignors to Pont-a-Mousson SA, Nancy, France

Filed Nov. 12, 1982, Ser. No. 441,010
Claims priority, application France, Nov. 20, 1981, 81 21931
Int. Cl.³ B65B *13/18, 27/10*; B66F *9/04*
U.S. Cl. 414—31 **16 Claims**



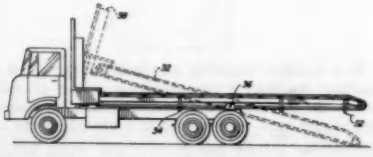
4. An apparatus for producing bundles (N) of pipes (P) from multiple pipe beds (L), comprising: a horizontal transporter (A) for beds of cast iron pipes; and loading means for loading said beds, at one end of said tranporter, onto a removal sled (D) which is movable transversely to the direction of movement of the beds of pipes on said transporter, wherein said loading means for loading said beds comprises shovel means (B) for removing the beds of pipes from the transporter, and an intermediate cradle (C) for receiving the beds of pipes from said shovel means, said intermediate cradle further functioning to transfer said beds of pipe onto said removal sled, said intermediate cradle being movable in height relative to said removal vehicle in an oblique direction between a high position above and a low position beneath said removal sled, wherein said intermediate cradle is movable along a guide path which is oblique at a first actue angle (y) in relation to the horizontal, said guide path being sloped downward in relation to the approach of said intermediate cradle towards said removal sled when said cradle is above said removal vehicle, and upward in relation to said removal sled when said intermediate cradle is beneath said removal vehicle.

4,441,848

SELF-LOADING MATERIAL TRANSPORTER

Gerald M. Bailey, P.O. Box 36373, Tucson, Ariz. 85740

Filed Sep. 4, 1981, Ser. No. 299,309
Int. Cl.³ B60P *1/38*
U.S. Cl. 414—439 **12 Claims**



1. A self-loading transporter comprising:

a. a land vehicle supported by wheels and having a bed including first and second ends and pivot means coupled to said bed in proximity to the second end of said bed, said vehicle further including a plurality of load support wheels coupled to said vehicle in proximity to said pivot means;

b. a conveyor system coupled to said pivot means and having a substantially linear upper surface and a lower surface, first and second ends, and a continuous flexible conveyor belt extending around the upper and the lower surface and the first and second ends for loading and unloading material from said vehicle, said conveyor system including a plurality of rollers positioned below the section of said conveyor belt passing along the upper surface of said conveyor system for providing low friction support for said conveyor belt, said conveyor system including a first section extending between said pivot means and the first end of said system and a second section extending between said pivot means and the second end of said system;

c. conveyor drive means for translating said conveyor belt in first or second directions along the upper surface of said conveyor system;

d. positioning means coupled to said vehicle and to the first section of said conveyor system for tilting said conveyor system between a horizontal position and an inclined position;

e. first velocity measurement means for determining the rate of translation of said vehicle with respect to the ground;

f. second velocity measurement means for measuring the rate of movement of said conveyor belt with respect to said conveyor system;

g. synchronization means coupled to said first and second velocity measurement means for synchronizing the rate of translation of said conveyor belt to the rate of translation of said vehicle whereby said conveyor belt is displaced at a velocity equal to the velocity of displacement of said vehicle with respect to the ground;

h. sensing means coupled near the second end of said conveyor system for generating an output signal representative of the spacing between the second end of said system and the ground; and

i. attitude control means coupled to said positioning means and responding to the output signal from said sensing means for actuating said positioning means to maintain a predetermined constant spacing between the second end of said conveyor system and the ground as said conveyor system is translated with respect to the ground;

whereby the weight of the material being loaded onto or unloaded from said transporter is transferred directly between the ground and said vehicle load support wheels without the assistance of auxiliary support wheels positioned between said load support wheels and the second end of said conveyor system.

4,441,849

APPARATUS FOR HOISTING LOADS TO ELEVATED BUILDING LOCATIONS

Michael J. Dizmang, 905 Highway 332, Apt. 1503, Lake Jackson, Tex. 77566

Filed Aug. 26, 1982, Ser. No. 411,689
Int. Cl.³ B60P *3/28*
U.S. Cl. 414—490 **9 Claims**

1. Apparatus for lifting and transporting a load to an elevated building location, comprising

an elongated carriage having

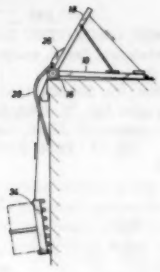
a flat bed with at least two wheels on a first end thereof and a cable connection on the second end thereof to provide for hauling of the carriage up a vertical wall of the building, the balance of the carriage being such as to cause the wheels on said first end to be closer to the wall structure than said second end,

a ramp pivoted near said first end with a collapsed position during the time said carriage is hauled up the building wall

and an inclined position after the carriage is at an elevated building location near the edge of the wall,

connectable support means for holding said ramp in its inclined position,

a platform for carrying said load and having a cable connection



for hauling said platform and load up the vertical wall of the building and onto said ramp of said carriage, said weight on said ramp, the inclined angle of said ramp and the weight distribution of said flat bed of said carriage being such that the flat bed does not raise up from a level position when the platform and load are in position on said ramp.

4,441,850

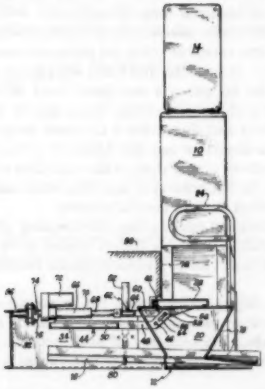
AUXILIARY STEP FOR WHEELCHAIR LIFT

Graham R. Thorley, La Mesa, Calif., assignor to Transporation Design Technology, Inc., San Diego, Calif.

Filed Apr. 9, 1982, Ser. No. 366,942

Int. Cl.³ B60P *1/46*; B60R *3/00*

U.S. Cl. 414—545 **7 Claims**



1. A retractable step mechanism alternately deployable in a step mode or in a substantially vertical barrier mode, said mechanism comprising:

a horizontally pivoted step element pivoted between said step mode in which said element is horizontally extended and said barrier mode in which said element is generally vertically extended;

a panel movable between said step mode in which said panel is stowed, and said barrier mode in which said panel aligns with and defines a vertical extension of said step element; and,

linkage mechanism linking said step element and panel and confining same to concomitant motion into and between said step and barrier modes,

wherein said panel is pivoted on a horizontal axis, said panel and step element each has an extending arm, said arms are linked together to define said linkage means, and

one of said arms defines a slot and the other of said arms engages said one arm slidably through said slot to define said linkage mechanism.

4,441,851

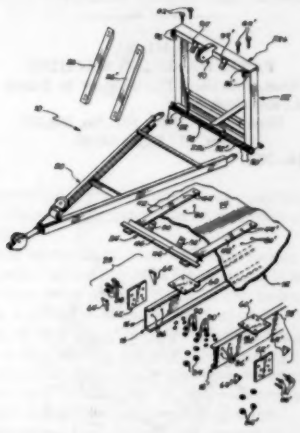
WRECKER ATTACHMENT

Robert G. Starkweather, E. Amherst, N.Y., assignor to Escort Systems, Inc., Amherst, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,066

Int. Cl.³ B60P *3/12*

U.S. Cl. 414—563 **5 Claims**



1. A wrecker attachment mounted on the bed of a pickup truck having an underlying supporting frame formed in part by a pair of transversely spaced frame members extending lengthwise of said bed and comprising in combination:

said attachment includes a boom assembly; a back post assembly for mounting said boom assembly; a floor plate assembly for positionally locating and bracing said back post assembly relative to said bed; a pair of brace members, said back post assembly having a horizontally disposed base portion and an upstanding post portion of inverted U-shaped configuration, said base portion mounting said boom assembly, said post portion mounting a pair of transversely spaced upper brace mounting flanges, said floor plate assembly is of a U-shaped plan view configuration and includes parallel side floor mounting plates laid flatwise on said bed and connecting plate means for joining rearwardly disposed ends of said side floor mounting plates and mounting a pair of transversely spaced lower brace mounting flanges, said base portion extending transversely of said side floor mounting plates adjacent front ends thereof, said pair of brace members having opposite ends thereof connected to said upper and lower brace mounting flanges, said base portion and said front ends of said floor mounting plates having groups of mounting apertures proximately located one group in vertical association with each of said frame members; attachment mounting bolts passed downwardly through said groups of mounting apertures and through mounting holes formed in said bed in alignment with said groups of mounting apertures; and a pair of mounting assemblies arranged beneath said bed one in association with each of said frame members and its associated group of mounting apertures, said assemblies each having a bed mounting

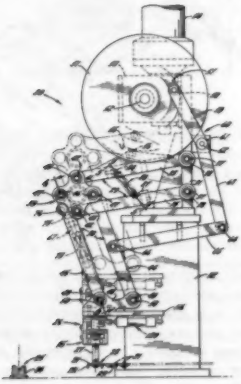
plate arranged to underengage said bed and formed with mounting openings disposed to receive said bolts passing through an associated group of mounting apertures for clamping said base portion and said floor mounting plates to an upper surface of said bed and said bed mounting plate to a lower surface of said bed, a frame mounting plate fixed to depend from said bed mounting plate in surface engagement with an adjacent one of said frame members to define a generally T-shaped structure, said frame mounting plate having a plurality of mounting openings aligned with mounting holes in said adjacent one of said frame members, assembly mounting bolts passed through said mounting openings of said frame mounting plate and aligned mounting holes in said adjacent one of said frame members for clamping said frame mounting plate to said adjacent one of said frame members, and gusset plates edge connected to said bed and frame mounting plates for rigidifying said structure.

4,441,852

PARTS HANDLING MACHINE

Paul H. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Filed Sep. 28, 1981, Ser. No. 306,205
Int. Cl.³ B65G *65/02*
U.S. Cl. 414—733 **10 Claims**



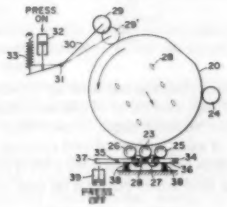
1. A parts handling machine comprising a support, gripping mechanism for selectively picking up and releasing a part, and means mounting said gripping mechanism on said support to move upwardly, then generally horizontally and thence downwardly, said mounting means comprising a first pair of generally horizontally extending and vertically spaced parallel links having inner end portions pivotally mounted on said support to swing upwardly and downwardly about generally horizontal axes, a second pair of generally vertically extending and horizontally spaced parallel links having lower end portions pivotally connected to said gripping mechanism to swing inwardly and outwardly about generally horizontal axes, a connector pivotally mounting the outer end portions of said first links to swing upwardly and downwardly about generally horizontal axes and pivotally mounting the upper end portions of said second links to swing inwardly and outwardly about generally horizontal axes, a reaction surface on said connector, spring mechanism carried by one of said second links, said spring mechanism having an upper end biased upwardly against said reaction surface and having a lower end portion acting through said one link to bias said gripping mechanism downwardly, the upper end of said spring mechanism riding along said reaction surface as said second links are swung inwardly and outwardly, said reaction surface being shaped and located so as to cause said spring mechanism to urge said gripping mechanism inwardly when said second links are at the end of their inward stroke and to urge said gripping mechanism outwardly when said second links are at the end of their outward stroke, a first actuator for swinging said first links upwardly and downwardly, and a second actuator for swinging said second links inwardly and outwardly in timed relation with the swinging of said first links.

4,441,853

DISC ORIENTING DEVICE

Masao Kosugi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 204,004, Oct. 31, 1980, abandoned.
This application Apr. 28, 1983, Ser. No. 487,414
Claims priority, application Japan, Nov. 5, 1979, 54-142937
Int. Cl.³ B65G *47/24*
U.S. Cl. 414—757 **2 Claims**



1. A device for orienting a disc having a flat portion formed on the outer periphery thereof, comprising:

a base plate on which a disc may be disposed;

at least one positioning means for point-contacting the outer periphery of said disc disposed on said base plate;

rotary drive means;

a first rotatable roller for point-contacting the outer periphery of said disc and coupled to said drive means for imparting a rotational force to said disc;

second and third rotatable rollers disposed on opposite sides of said first rotatable roller for point-contacting the outer periphery of said disc and being coupleable to said drive means for imparting a rotational force to said disc, the periphery of said first roller being spaced, in a direction away from said disc, from a common tangent to the peripheries of said second and third rollers that lies adjacent the periphery of said disc, so that said first roller does not contact the flat portion of said disc when said second and third rollers contact the flat portion;

clutch means for interrupting the coupling of said second and said third rotatable rollers to said drive means when said disc has come to a predetermined rotational position; and

resiliently urged roller means for engaging said disc for moving it toward said positioning means and said first roller when the coupling of said second and said third rollers to said drive means is interrupted by said clutch means.

4,441,854

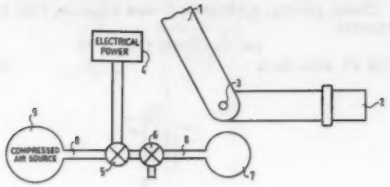
CONTROLLING POSITIONING SYSTEMS UPON REMOVAL OF POWER

Paul Di Matteo, Huntington, and Joseph Ross, Fort Salonga, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Aug. 5, 1981, Ser. No. 290,237
Int. Cl.³ B65G *43/06*
U.S. Cl. 414—787 **1 Claim**

1. A system for preventing damage to one type of equipment in response to uncontrolled dropping of another theretoconnected second type of equipment resulting from removal of

electrical power to the second equipment, comprising: means for detecting the power loss; and means for preventing the dropping of the second type of equipment; said detecting means comprising a spring-loaded solenoid valve; and the



preventing means comprising inflatable bag means positioned to prevent dropping of the second equipment, a source of fluid under pressure, and conduit means connecting said bag means and source and having said solenoid valve interposed therein.

4,441,855

COMPRESSORS

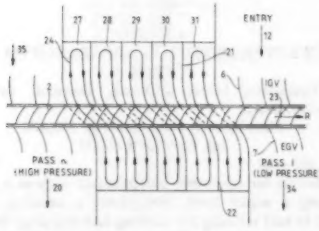
Colin A. M. Tayler, Bath, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 11, 1981, Ser. No. 242,566

Claims priority, application United Kingdom, Mar. 20, 1980, 8009450

Int. Cl.³ F04D *5/00*

U.S. Cl. 415—53 T **6 Claims**



1. An axial flow rotary compressor having a rotor provided with a multiplicity of blades distributed around its periphery for rotation between a row of upstream stator blades and a row of downstream stator blades and having disposed adjacent to the rotor blades at least one low pressure fluid inlet duct, at least one circumferentially spaced high pressure fluid outlet duct and a flow splitter positioned between a fluid inlet duct and a fluid outlet duct to separate the low pressure fluid from the high pressure fluid, wherein the flow splitter comprises a plurality of contiguous chambers positioned around a portion of the rotor, each chamber forming a duct for a loop fluid flowpath intersecting the path of the rotor blades such that in use there is a continuous fluid flow through the rotor blades as the blades pass the flow splitter.

4,441,856

STEAM TURBINE FOR GEOTHERMAL POWER GENERATION

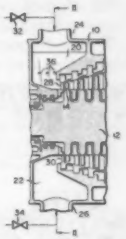
Kazunari Tsujimura, Tokyo, and Yoshikazu Hadano, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 21, 1981, Ser. No. 313,615

Claims priority, application Japan, Oct. 22, 1980, 55-149743[U]

Int. Cl.³ F01D *17/18, 9/04*

U.S. Cl. 415—155 **4 Claims**



3. A steam turbine for geothermal power generation utilizing the steam of geothermal water, said steam turbine comprising:

(a) a casing;

(b) turbine vanes rotatably set within the casing;

(c) a plurality of partition walls which extend in radial directions from the rotational center of the turbine vanes to define a plurality of steam valve chambers within the casing, at least one of said partition walls being provided with at least one circumferentially extending penetrating hole for causing adjacent steam valve chambers on either side of said at least one of said partition walls to be brought into communication with each other;

(d) steam supply pipes respectively connected to the corresponding steam valve chambers; and

(e) regulating valves which are fitted to the respective steam supply pipes to regulate respectively the flow rate of steam jets of the geothermal water supplied to respective steam valve chambers,

whereby the steam of the geothermal water existing in one of the steam valve chambers flows through the penetrating hole into an adjacent chamber, thereby preventing solid particles entrained in the geothermal water from clogging the steam turbine.

4,441,857

WEAR RESISTANT FAN BLADE FOR CENTRIFUGAL FAN

John E. Jackson, Brownsburg, and William G. Doherty, Lebanon, both of Ind., assignors to Union Carbide Corporation, Danbury, Conn.

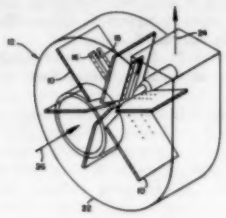
Filed Sep. 25, 1981, Ser. No. 305,728

Int. Cl.³ F04D *29/02*

U.S. Cl. 415—213 R **10 Claims**

1. A fan blade for use in exhausting a gas stream effluent containing erosive particles from a radial flow fan comprising, in combination, a serrated surface forming in longitudinal cross-section a sawtooth configuration in the radial direction of the rotating blade with each serration having a notched apex which intersects a line drawn normal to the back edge of the blade for forming an inlet angle with the inlet surface of the serration and an exit angle with the exit surface of the serration with the combined included angle between the inlet surface and the exit surface lying between sixty and one hundred and twenty degrees and oriented so as to trap erosive particles in

the serrations with the serrated surface extending from substantially about the exit tip of the blade toward the inlet end



thereof and having a wear resistant coating over at least a substantial area of the serrated surface.

4,441,858

VARIABLE CAMBER FLUID POWER MACHINE

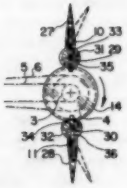
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 63,141, Aug. 2, 1979, Pat. No. 4,286,922. This application Feb. 20, 1981, Ser. No. 236,207

The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.

Int. Cl.³ F03D *3/06*

U.S. Cl. 416—17 **4 Claims**



1. Another variable camber fluid power machine comprising in combination:

(a) a central shaft;

(b) a plurality of arms extending axisymmetrically from said central shaft, said plurality of arms rotatable about said central shaft;

(c) a plurality of blades, each of which plurality of blades disposed near the outer extremity of each of said plurality of arms rotatably about an axis generally parallel to said central shaft;

(d) mechanical or hydraulic means linking the rotational motion of said plurality of blades about the blade axis to the revolving motion of said plurality of blades about said central shaft wherein each of said plurality of blades undergoes 180 degree rotation per 360 degree revolution by each of said plurality of blades about and relative to said central shaft;

(e) a plurality of pairs of flaps, each of said pairs of flaps pivotably disposed to each edge of each of said plurality of blades wherein said each of said pairs of flaps is pivotable about an axis generally parallel to said central shaft; and

(f) mechanical or hydraulic means linking the deflection of said pairs of flaps to the revolving motion of said plurality of blades about and relative to said central shaft wherein the maximum camber generating higher lift force takes place at angles of revolution equal to or somewhat greater than or somewhat less than 90 and 270 degrees, said angle of revolution measured from the minimum drag position of revolution.

4,441,859

ROTOR BLADE FOR A GAS TURBINE ENGINE

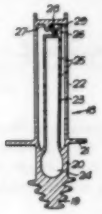
John H. R. Sadler, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Jan. 20, 1982, Ser. No. 341,189

Claims priority, application United Kingdom, Feb. 12, 1981, 8104334

Int. Cl.³ F01D *5/10, 5/18*

U.S. Cl. 416—96 A **10 Claims**



1. A rotor blade for a gas turbine engine comprising:

a hollow aerofoil having a predetermined vibrational characteristic;

a component mounted internally of said hollow aerofil and having a vibrational characteristic different from said vibrational characteristic of said hollow aerofoil;

said hollow aerofoil and said component having facing surfaces defining a gap therebetween; and

a damper weight having a center of gravity and positioned internally of said aerofoil in said gap betwen said facing surfaces of said hollow aerofoil and said component, said damper weight being eccentrically mounted within said gap with a first point of contact with a one of said facing surfaces on said hollow aerofoil and a second point of contact with another of said surfaces which is on said component, said first point of contact being out of radial alignment with said center of gravity of said damper weight to cause said damper weight, when under centrifugal force, to rotate about said first point of contact and to apply a sideways load to both said hollow aerofoil and said component and to further frictionally engage with both of said facing surfaces.

4,441,860

WATER LEVEL DETECTOR APPARATUS OF FLOAT TYPE

Haruo Tsujimoto, 16-39, 4-Chome, Tsurumi, Tsurumi-Ku, Osaka-shi, Japan

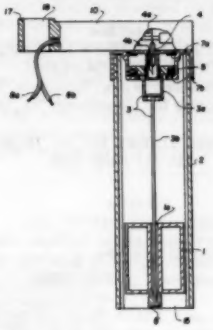
Filed Mar. 1, 1982, Ser. No. 353,439

Int. Cl.³ F04B *49/04*

U.S. Cl. 417—40 **11 Claims**

1. A device for operating an apparatus such as a pump for controlling a water level, comprising a housing, a switch mounted in said housing for starting and stopping the apparatus and having a magnetically influenced openable and closable contact, a float in said housing floatable on the water level to be controlled and changing in level with the change of water level, a movable driven member associated with said float in said housing, means establishing a loss motion connection between said float and said driven member causing movement of said float upon change of water level by a predetermined amount before causing movement of said driven member in each direction of level change, said driven member having a magnetic actuator actuating the contacts of said switch positionable by movement of said float into a first position to locate said actuator in an area in which it influences said switch to cause its contacts to move to a selected one of an opened and closed position, and being movable to a second position spaced away from said first position upon movement of said float to a different level in which it influences said switch to move its

contacts to the opposite direction of the selected position, holding means holding said magnetic actuator in said first and second positions by a predetermined holding force which may



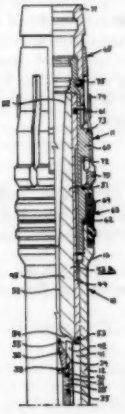
be overcome by movement of said float only after a predetermined change of level, said holding means comprising a pair of magnetic holders, one for holding said magnetic actuator in each of said first and second positions.

4,441,861

WELL PRODUCTION APPARATUS AND METHOD

Carlos R. Canalizo, 10511 Allegheny Dr., Dallas, Tex. 75229

Filed Jul. 10, 1981, Ser. No. 282,138
Int. Cl.³ F04F 5/00
U.S. Cl. 417—54 **10 Claims**



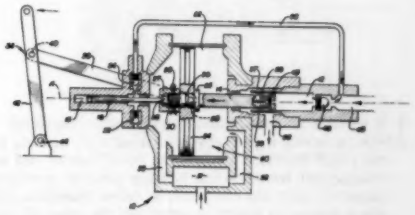
1. A jet pump assembly for producing a well comprising: a pump housing having a longitudinal bore provided with an inlet end, a transverse bore opening into said inlet end, and an outlet end for discharge into a producing flow path having an axis aligned with the axis of said housing bore; a nozzle body and a nozzle arranged in tandem in said longitudinal bore near the inlet end thereof downstream from said transverse bore for receiving power fluid introduced into said housing through said transverse bore; said nozzle body having longitudinal bypass flow passages separate from and around said transverse bore and said nozzle body and nozzle from an inlet end of said housing into said bore of said housing downstream from said nozzle for flowing producing fluids from below said pump into said pump bore downsteam from said nozzle; a throat member in said housing bore downstream from said nozzle and from the entry of said bypass flow passages for producing fluids into said housing bore; a diffuser in said housing bore downstream from said throat member; said nozzle body, said nozzle, said throat member, and said diffuser being arranged in tandem along a substantially straight longitudinal axis for substantially straight line flow of power fluid and producing fluids through said jet pump into a producing flow passage having an axis substantially aligned with said axis through said pump housing bore whereby producing fluids entrained in said power fluid through said jet pump and into said producing flow passage move along a substantially straight line path without impinging upon internal surfaces in said well; a locking mandrel assembly on said housing around said diffuser for releasably locking said jet pump along a producing fluids tubing string for producing fluids through said tubing string with said pump from below said pump into said string above said pump along a substantially straight line flow path; and a seal assembly on said housing above said transverse flow passage around said diffuser adapted to seal with the inner wall of a tubing for sealing off an annulus in said tubing around said housing to direct power fluid into said transverse flow passage.

4,441,862

SYNCHRONIZED MIXING PUMP

Benjamin Vogel, Encino, Calif., assignor to Haskel, Inc., Burbank, Calif.

Filed Dec. 7, 1981, Ser. No. 328,072
Int. Cl.³ F04B 17/00
U.S. Cl. 417—250 **7 Claims**



1. A mixing pump comprising:
a primary pumping chamber;
a mixing chamber;
first valve means for admitting a mixture of a main fluid and an additive fluid from said mixing chamber to said primary pumping chamber;
second valve means for emitting said mixture from said primary pumping chamber;
a primary piston reciprocable in said primary pumping chamber for drawing said mixture into said primary pumping chamber through said first valve means on a first stroke and for expelling said mixture from said primary pumping chamber through said second valve means on a second and opposite stroke, said second valve means being disposed within said primary piston;
an annular passage surrounding said piston as said piston enters said primary pumping chamber;
an outlet passage for fluid emitted from said primary pumping chamber arranged to receive said fluid from said annular passage;
a secondary pumping chamber;
third valve means for admitting said additive fluid to said second pumping chamber;
fourth valve means for emitting said additive fluid from said secondary pumping chamber;
a secondary piston reciprocable in said secondary pumping chamber for drawing said additive fluid into said secondary pumping chamber through said third valve means on a first stroke and for expelling said additive fluid from said

secondary pumping chamber through said fourth valve means on a second and opposite stroke;

mixing conduit means leading from said fourth valve means to said mixing chamber; and

means for causing said primary and secondary pistons to reciprocate in synchronization such that said first stroke of said primary piston corresponds to said second stroke of said secondary piston and said second stroke of said primary piston corresponds to said first stroke of said secondary piston.

4,441,863

VARIABLE DISCHARGE ROTARY COMPRESSOR

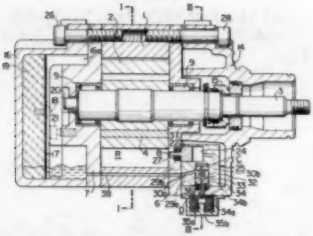
Teruyuki Hotta, Nagoya; Yoshiki Kurokawa, Okazaki; Eiichi Nagasaku, Chiryu, and Masao Yasunaga, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 26, 1982, Ser. No. 342,808

Claims priority, application Japan, Jan. 27, 1981, 56-10016[U]; Jan. 27, 1981, 56-10017[U]

Int. Cl.³ F04B *49/02, 49/06*

U.S. Cl. 417—281 **3 Claims**



1. A variable discharge rotary compressor comprising:

a housing having a generally cylindrical main housing part, end plates provided to close the open ends of said main housing part, front and rear housing members provided to cooperate with said end plates to define chambers one of which acts as an intake chamber and the other of which acts as a discharge chamber;

a rotor rotatably mounted in said main housing part;

a plurality of vanes slidably mounted on said rotor to cooperate with said main housing part, said end plates and said rotor defining working chambers having volumes which are variable by the rotation of said rotor so that each of said working chambers operates to suck an amount of fluid from said intake chamber, to compress the thus sucked fluid and then to discharge the thus compressed fluid into said discharge chamber;

the end plate adjacent to said intake chamber being formed therein with a first passage means for communicating said intake chamber and the working chambers when in their compression strokes;

a first valve means for controlling the communication through said first passage means between said working chambers in compression strokes and said intake chamber;

said discharge chamber including a section which acts as a reservoir for oil which is under the fluid pressure in said discharge chamber;

a second passage means formed in said housing and extending between said oil reservoir and said first valve means for applying the oil pressure to said first valve means;

said first valve means being responsive to the oil pressure from said oil reservoir to block said first passage means; and

a second pilot valve means disposed in said housing to control the application of the oil pressure to said first valve means and having a first position in which the oil pressure is applied through said second passage means to said first valve means when the discharge of said compressor does not exceed a predetermined discharge requirement and a second position in which the oil pressure is not applied to said first valve means when the compressor discharge exceeds said predetermined requirement.

4,441,864

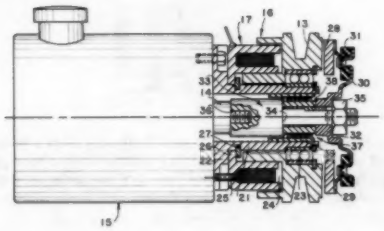
HYDRAULIC PUMP WITH A MAGNETICALLY OPERATED COUPLING

Jeffrey E. Watts, 50 Anderson Ave., Westbrook, Me. 04092, and Edward E. Watts, Star Rte., Manchester Rd., Steep Falls, Me. 04085

Filed Feb. 11, 1981, Ser. No. 233,450

Int. Cl.³ F04B *9/00*

U.S. Cl. 417—319 **5 Claims**



1. A hydraulic pump to be driven by a pulley having a belt trained about it and a pulley driven by the motor vehicle engine on which the pump is mounted, an elongated hub attached to the pump casing, a bearing unit rotatably supporting said pulley on the front end of the hub said pump including a drive shaft extending freely through the hub, an electro-magnet supported by said hub rearwardly of said pulley, a clutch disc including a portion engageable with said pulley only when said electro-magnet is energized and fixed on the free end of said shaft, and a bearing means fitted between said adapter shaft and the outer end of said hub substantially in radial alignment with said first bearing.

4,441,865

FLUID PRESSURE PUMP

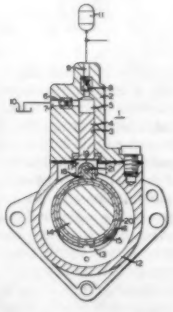
Diether Staisch, Walsrode, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,316

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048265

Int. Cl.³ F04B *9/00, 35/00*

U.S. Cl. 417—319 **6 Claims**



1. A fluid pressure pump comprising,

(a) a pump housing, said pump housing including a cylinder bore and inlet and outlet valves,
(b) a reciprocating piston disposed within the cylinder bore for forming a pump chamber on one end thereof,
(c) a crankshaft housing mounted on said pump housing, a rotatable drive shaft carried by said crankshaft housing,
(d) an eccentric connected to said rotatable drive shaft for activating said reciprocating piston,
(e) a spring flexibly linking said piston to said eccentric,
(f) said spring takes the form of a split-ring which is pre-loaded and which frictionally engirds said eccentric and which becomes released when the force transmitted by said piston exceeds the pre-loaded force.

4,441,866

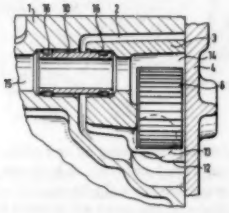
OIL PUMP ARRANGEMENT

Heribert Kubis, and Karl Schott, both of Nuremberg, Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Continuation of Ser. No. 66,627, Aug. 15, 1979, Pat. No. 4,334,836. This application Oct. 7, 1981, Ser. No. 309,412

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—364 **1 Claim**



1. A lubricant pump arrangement for supplying pressurized lubricant to an internal combustion engine having a cast crank case and a set of timing gears in a timing gear case, the lubricant pump arrangement comprising in combination with the internal combustion engine:

a rough case recess cast in the cast crank case of the engine and left unmachined, the recess being defined by a side wall, a rear wall and an open side, and the recess having an inlet opening through the side wall and an outlet opening extending normally through the rear wall;

a pump housing, smaller than the rough case recess, and forming a space therebetween when seated therein; the pump housing having an open front and a closed back, the closed back having an outlet opening extending normally therethrough and journal means therein; the pump housing further having a surrounding side wall with an inlet opening through the bottom thereof;

two impeller gears having gear shafts with one end journalled in the journal means of the closed back of the pump housing and contained within the pump housing, one of the impeller gears having a drive shaft thereon extending beyond the open side of the rough case and the open front of the pump housing;

a driving gear meshed with the set of timing gears and connected to the drive shaft for rotating the drive shaft and driving the impeller gears;

a closure closing the open side of the recess and open front of the pump housing and being disposed between the driving gear and pump housing, the closure being one wall of the timing gear case and having journals therein for journaling the other ends of the gear shafts;

a rigid tube connecting the outlet opening through the rear wall of the recess to the outlet opening of the pump housing, the rigid tube being smaller than either opening and having flexible sealing gaskets at both ends thereof for effecting seals between the opening through the rear wall of the recess and the opening through the closed back of the pump housing; whereby the pump housing is movable with respect to the crank case recess during assembly thereof so as to ease the assembly process while lessening the volume consumed by the engine while helping to minimize the expense of engine manufacture.

4,441,867

PERISTALTIC PUMP

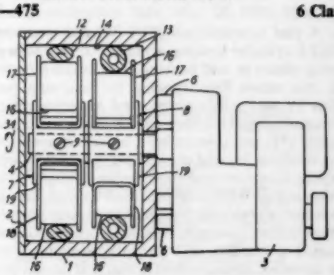
Rudolph Berelson, Treelawns, 34 Fallowfield, Stanmore Hill, Stanmore, Middlesex, England

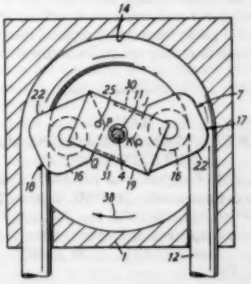
Filed Mar. 25, 1982, Ser. No. 361,592

Claims priority, application United Kingdom, Oct. 20, 1981, 8131573

Int. Cl.³ F04B *43/12, 45/08*

U.S. Cl. 417—475 **6 Claims**



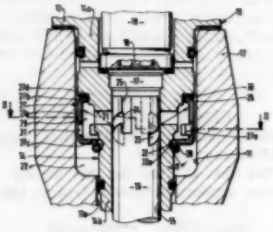


1. A peristaltic pump comprising a single reversible motor, a shaft driven thereby, and at least two rotors turned by said shaft, said rotors respectively passing over an associated separate resiliently compressible tube when the motor is on, wherein each rotor comprises a carrier adapted to be mounted on said shaft, a plurality of separate roller mountings each pivoted to said carrier, a roller individually mounted for rotation in each roller mounting, and stop means provided on the carrier and on each roller mounting for limiting pivotal motion of said roller mountings with respect to said carrier between a first limiting position at which the rollers are extended towards the associated tube and a second limiting position at which the rollers are retracted from the associated tube, the construction being such that the rollers of a first of said at least two rotors become extended and those of a second of said at least two rotors become retracted when the shaft is turning in one direction, and vice versa when the motor is reversed.

4,441,868
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Helmut Fiedler, Glen-Ellyn, Ill., and Ernst Ritter, Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,731
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136749
Int. Cl.³ F02M *59/44*
U.S. Cl. 417—490 **8 Claims**

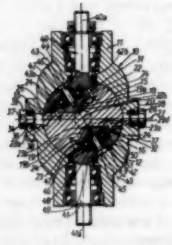


1. A fuel injection pump for internal combustion engines having a cylinder bushing arranged to receive a pump piston, a pump piston in said bushing, said bushing further having at least one return flow opening for returning fuel flow controlled by said pump piston, and an impact protection ring positioned on said bushing, said impact protection ring having a center (M) and pressed by a holder means against an abutment shoulder located above said return flow opening in the pumping direction, said ring further having a cylindrical wall portion and an inner wall provided with means defining openings therethrough which enclose an annular chamber, said wall portion further having flowthrough openings in said inner wall arranged to connect said return flow opening with a return flow chamber, characterized in that said impact protection ring is further provided with guide faces exposed to said returning fuel and causing a rotational movement on the part of said impact ring, said guide faces being molded into said cylindrical wall portion such that they are inclined toward said center (M) of said ring.

4,441,869
POWER CONVERSION MACHINE HAVING A NUTATING PISTON

Thor Larsen, Nils Langhellesvei 31, 5033, Fyllingsdalen, and Terje Samdal, Smoeraaslia 24, 5050, Nesttun, both of Norway

Filed Jan. 15, 1982, Ser. No. 339,777
Claims priority, application Norway, Mar. 2, 1981, 810691
Int. Cl.³ F01C *1/00, 19/00*
U.S. Cl. 418—51 **18 Claims**



1. In a power conversion machine having a housing defining a double-curved space and having a partition plate fixedly mounted therein dividing said space into two semi-spherical chambers and having a diametrically extending slot therein; a piston including

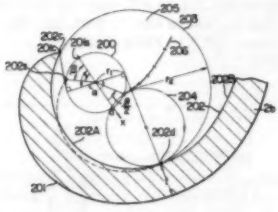
a disc-shaped main portion extending through said slot and having a pair of sector-shaped cavities; and

a pair of conic-shaped roller portions, each said roller portion being fixed to said main portion within a respective cavity and being disposed on an opposite side of said partition from the other of said roller portions.

4,441,870
SCROLL MEMBER

Masato Ikegawa; Eiji Sato, both of Ibaraki, and Kenji Tojo, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,395
Claims priority, application Japan, Oct. 27, 1980, 55-149401
Int. Cl.³ F01C *1/02*
U.S. Cl. 418—55 **6 Claims**



1. A scroll member comprising an end plate, an upstranding wrap of a vortical form located on at least one surface of said end plate, said wrap having a thickness and a height, boundaries of the thickness of the wrap are defined by an outer side wall surface and an inner side wall surface thereof, the inner side wall surface of the wrap includes an arcuate starting end portion in the form of an arc of a circle of a predetermined radius, the radius of the arc is equal to a radius of a circle in contact with the outer side wall surface and the inner side wall surface of the wrap.

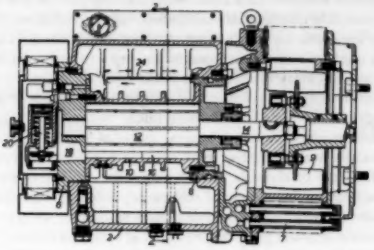
4,441,871
ROTARY COMPRESSORS WITH PRIMARY AND SECONDARY OIL SEPARATION MEANS

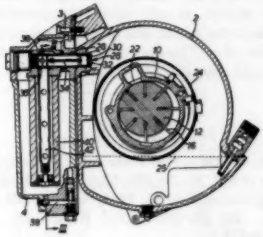
Edward Boller, Lapal, England, assignor to Hydrovane Compressor Company Limited, United Kingdom

Filed Dec. 18, 1981, Ser. No. 336,354
Int. Cl.³ F04C *29/02;* B01D *45/06, 46/24*
U.S. Cl. 418—97 **13 Claims**

1. A rotary oil mist compressor having a compressor casing, a rotor stator unit within the casing for compressing air into which oil has been injected, said compressor including a primary oil separation means for removing a portion of the entrained oil from the compressed air and a secondary oil separation means for removing substantially the remainder of the entrained oil, a compressor housing, the rotor stator unit and the primary separation means being situated within the compressor housing; a separate housing detachably secured to the compressor housing and said secondary separation means being situated in the separate housing, the primary and secondary oil separation means being connected by a pathway characterised in that the pathway includes a secondary separation manifold, in which oil droplets coalesce and collect, an oil return passageway communicating with the manifold and the compressor casing for returning the oil collected in the manifold to the compressor casing for re-use and a primary tube communicating between the compressor housing and the secondary separation housing, said primary tube having apertures in its side wall at its inlet end communicating with the interior

of the compressor housing and apertures in its side wall at its outlet end communicating with the secondary separation mani-





fold, the axis of said inlet and outlet apertures being at a substantial angle to the longitudinal axis of said tube.

4,441,872

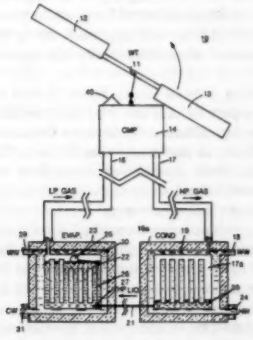
FLUID ENERGY CONVERSION SYSTEM

Joseph B. Seale, 31 Avalon Dr., East Falmouth, Mass. 02536

Continuation-in-part of Ser. No. 254,084, Apr. 14, 1981, abandoned. This application Apr. 29, 1981, Ser. No. 258,751

Int. Cl.³ 290 *44*; F03D *9/00*

U.S. Cl. 417—282 **15 Claims**



1. A fluid energy conversion system, comprising:

(A) variable fluid energy source means;

(B) variable load means;

(C) transformer means responsive to said energy source and load means, including means for determining the relative energies associated with said load and source means for controlling the period during which said load and source means are coupled together, substantially continuously to match the impedances of said source and load means, such that substantially maximum energy transfer takes place substantially continuously,

said transformer means including fluid relief means for controlling said period and electronic control means,

said electronic control means having, means for sensing a selected parameter of said system, means responsive to said sensed parameter for actuating said fluid relief means, and computer means responsive to said sensed parameter for computing said period during which said source and load means are coupled for transferring power from said source to said load means,

said computer means including

means for computing the amount of energy that can be transferred during the remainder of a transformer cycle;

means for predicting a desired level of energy available from said source means; and

means for initiating said period only if said energy level available from said source means exceeds said amount.

4,441,873

MACHINE FOR FORMING PREFABRICATED BUILDING COMPONENTS

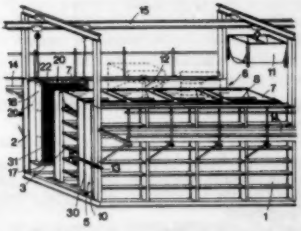
Edoardo Maccarinelli, Via Gramsci 30, Brescia, Italy

Filed Mar. 12, 1982, Ser. No. 357,720

Claims priority, application Italy, Mar. 20, 1981, 5135 A/81

Int. Cl.³ B28B *7/22*

U.S. Cl. 425—64 **4 Claims**



1. In a machine for forming prefabricated components for the building industry from a prefabricating component mixture, the combination of:

two fixed lateral frames arranged parallel to and at a distance from each other, each having an internal vertical wall panel provided with a smooth continuous surface facing the surface of the panel of the other fixed frame,

an intermediate movable bilateral frame arranged between the two fixed frames and having two corresponding vertical wall panels each provided with a smooth continuous surface opposite to a corresponding facing surface of the two wall panels of the two panels of the fixed frames, said movable frame being arranged for guided alternate movement horizontally toward and away from each of the fixed frames and thereby defining two alternative mold spaces of variable breadth between the surfaces of the movable frame and the corresponding opposite facing surfaces of the fixed frames, which mold spaces can be used alternative for forming prefabricated components, said movable frame being fitted with locking devices securable, when the machine is in use, on one or the other of said fixed frames,

at least one mixing vessel for preparation of the mixture which is intended to form the prefabricated component, said at least one vessel being mounted on the top of said movable frame and being capable of being alternately tipped in the direction of each mold space defined between the movable frame and the two corresponding fixed frames,

horizontal and vertical means arranged for positioning alternatively between the opposing surfaces defining each

mold space for defining the thickness, height and length dimensions of the component which is to be manufactured in the corresponding mold space, said means consisting of a horizontal section arranged for positioning in the bottom of the corresponding mold space, and a pair of opposed vertical end molds arranged for interconnection by means of tie rods and adapted to support reinforcing means and/or mold the component to be formed and

means for the measured addition to the at least one mixing vessel of the starting materials for providing said mixture.

4,441,874

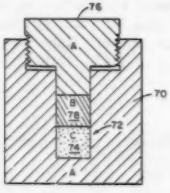
APPARATUS FOR DIFFERENTIAL EXPANSION VOLUME COMPACTION

Kaplesh Kumar, Wellesley, and Dilip K. Das, Bedford, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Division of Ser. No. 58,530, Jul. 18, 1979, Pat. No. 4,260,582. This application Nov. 5, 1980, Ser. No. 206,877

Int. Cl.³ B22F *3/00*

U.S. Cl. 425—78 **13 Claims**



1. Apparatus for molding articles from particulate material comprising:

a mold having a cavity adapted to contain said particulate material to be formed into said article;

at least one element adapted to closely fit the cavity of said mold and having a coefficient of thermal expansion higher than said mold;

said mold adapted to constrain said element so as to cause plastic deformation of said element upon heating induced expansion of said element within said cavity with resulting compression of particulate material filling said cavity and bonding of said particles to form said article.

4,441,875

MOLD APPARATUS FOR FORMING ARTICLE UNDER INFLUENCE OF MAGNETIC FIELD

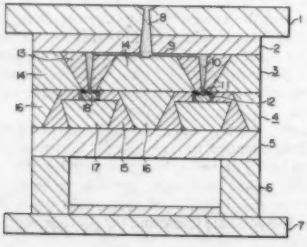
Takahide Saito, Takatsuki, and Yasuo Nakagawa, Nishinomiya, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,354

Claims priority, application Japan, Mar. 5, 1982, 57-34049

Int. Cl.³ B29C *1/022*

U.S. Cl. 425—3 **2 Claims**



1. A mold apparatus for forming ring-shaped magnets from a plastic magnet material containing a magnetic powder under the influence of a magnetic field, comprising a stationary intermediate composite retainer plate and a movable intermediate composite retainer plate, the former being put on the latter;

said movable intermediate composite retainer plate consisting of at least one cylindrical or inversed frusto-conical cavity block made of a magnetic material having a ring-shaped cavity, at least one cavity block holder made of a non-magnetic material embracing and holding said cavity block and at least one cylindrical or inversed frusto-conical magnetism shielding member made of a non-magnetic material and disposed concentrically and in contact with the lower side of said cavity, the diameter of the side of said magnetism shielding member contacting the lower side of said cavity being greater than the outside diameter of said cavity; said stationary intermediate composite retainer plate consisting of at least one cylindrical or inversed frusto-conical sprue block made of a magnetic material, at least one sprue block holder made of a non-magnetic material embracing and holding said sprue block, said sprue block being placed on said cavity concentrically with the cavity, the diameter of the side of said sprue block contacting the upper side of said cavity being not larger than the inside diameter of said cavity.

4,441,876

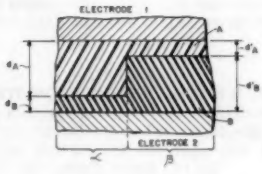
FLOW MOLDING

Michel Marc, 48 Ridge Hill Farm Rd., Wellesley, Mass. 02181

Continuation of Ser. No. 41,982, May 24, 1979, abandoned. This application Sep. 11, 1981, Ser. No. 301,313

Int. Cl.³ B29C *1/02*; B29G *7/00*

U.S. Cl. 425—174.8 E **7 Claims**



1. An apparatus for molding a part having at least two sections of different thicknesses and for providing uniform heating throughout each section, said apparatus comprising:

first and second electrodes uniformly spaced from each other;

means defining a mold cavity between said electrodes for molding a part from a material to be molded, said mold cavity having different dimensions measured along lines perpendicular to said electrodes in the different portions thereof that form the different sections of the part; and

means for establishing a capacitive electromagnetic heating field between said electrodes;

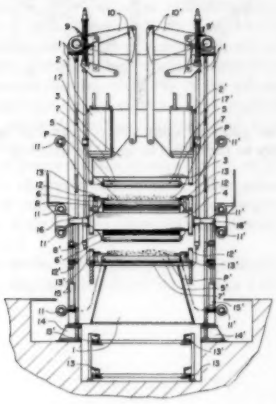
said defining means being formed of a mold material and an additive material, said additive material being different from said mold material and also different from the material to be molded, said additive material having a high dielectric constant higher than the dielectric constant of the material to be molded and at least an order of magnitude higher than the dielectric constant of said mold material, said mold material and said additive material both having a power factor lower than the material to be molded, said additive material being added to said mold material to equalize the dielectric constant between the material to be molded and said defining means to provide a uniform capacitance at all locations between said electrodes across said mold cavity throughout said different portions thereof and to provide uniform heating across said mold cavity.

4,441,877

DOUBLE OPENING PRESS FOR MANUFACTURING WOOD CHIPBOARD AND FIBRE-BOARD OR THEIR SUBSTITUTES, PROVIDED WITH FOUR HEATING PLATENS, IN WHICH THE TWO CENTRAL PLATENS ARE SEPARATED BY A RIGID PLATE

Giorgio Pagnoni, Monza, Italy, assignor to F.Ili Pagnoni S.p.A., Italy

Filed Jan. 21, 1982, Ser. No. 341,252
Claims priority, application Italy, May 22, 1981, 21913 A/81
Int. Cl.³ B29J 5/00; B30B 7/02, 15/06
U.S. Cl. 425—338 5 Claims



1. A double opening press for manufacturing particle board comprising:

a frame having a lower fixed plate;

and upper movable plate mounted to said frame;

upper plate drive means connected to said upper movable plate for moving said upper movable plate vertically;

outer heating platens connected to a top surface of said lower fixed plate and a bottom surface of said upper movable plate;

a rigid intermediate plate extending between said upper and lower plates and connected to said frame;

upper and lower additional heating platens fixed to upper and lower surfaces of said intermediate platen whereby upper and lower openings are defined between said intermediate plate and said upper and lower plates respectively

intermediate plate drive means connected between said plate and said frame for driving said intermediate plate vertically;

said upper and lower additional heating platens are electrically insulated from said rigid intermediate plasten between upper and lower surface of said intermediate plate and said upper and lower additional heating platens respectively; and

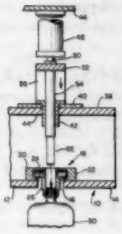
guide means connected between said intermediate plate and said frame and a plurality of spacers connected to said intermediate plate for setting a thickness of a particle board to be produced, said intermediate plate drive means, guide means and spacers, and said intermediate plate being grounded and being made of non-electrically insulating material.

4,441,878

BOTTLE EJECTOR

Ieuan L. Harry, Nashua, N.H., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Oct. 28, 1981, Ser. No. 315,844
Int. Cl.³ B29C 17/07; B65G 47/36
U.S. Cl. 425—534 20 Claims



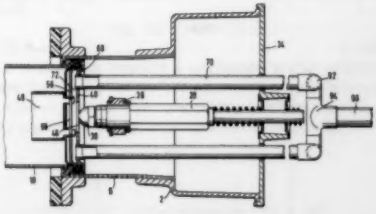
1. In a machine of the type wherein plural blow molded articles are delivered by a pallet having a plurality of collets each carrying a blow molded article, a blow molded article ejector, said machine comprising a track for receiving a pallet and determining the position of such pallet and the collets thereof; and said blow molded article ejector comprising a guide device overlying said track, a plurality of ejector plungers carried by said guide device and spaced longitudinally of said track in accordance with the spacing of collets wherein each ejector plunger is aligned with a collet of an underlying pallet, and means for moving said ejector plungers in unison to enter into aligned collets and engage and eject blow molded articles carried by the collets from the collets.

4,441,879

OIL AND GAS BURNER FOR INSTALLATION IN HEATING AND STREAM-PRODUCING BOILERS

Ulrich Wagner, Hamburg, and Winfried Buschulte, Neckarsulm, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg, Augsburg and Deutsche Forschungs-und Versuchsanstalt fur Luft- und Raumfahrt E.V., Cologne, both of, Fed. Rep. of Germany

Filed Sep. 18, 1981, Ser. No. 303,640
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1980, 3035707
Int. Cl.³ F23D 17/00
U.S. Cl. 431—284 13 Claims



1. An oil burner for installation in heating and steam-raising boilers having an oil atomizer device, comprising a first plate located downstream of the oil atomizer device and having at least one opening formed therein that defines a passageway for atomized oil and further defining the sole passageway for combustion air, a mixing tube positioned coaxially with respect to the opening in said first plate and spaced downstream therefrom having a diameter greater than the diameter of a circle surrounding the passageway in said first plate; a flame tube

coaxially surrounding said mixing tube and having a length such that combustion gases flowing downstream of said mixing tube are received against an inner wall of said flame tube, and downstream of said first plate, an annular chamber for the supply of gaseous fuel having gas outlet openings in the region of said at least one opening in said first plate, said annular chamber being formed by said first plate and a second plate spaced a short distance downstream of said first plate, and at least one gaseous fuel supply tube being mounted on the upstream side of said first plate.

4,441,880

DRYING APPARATUS

Colin S. Pownall, Southwell, and Joseph L. Spencer, West Bridgford, both of England, assignors to Pownall Spencer Engineering, Ltd., Southwell, United Kingdom

Filed Apr. 6, 1982, Ser. No. 366,001

Claims priority, application United Kingdom, Apr. 23, 1981, 8112650

Int. Cl.[3] **F27B** *14/00*; **F26B** *9/18, 11/00*; **F23B** *5/00*

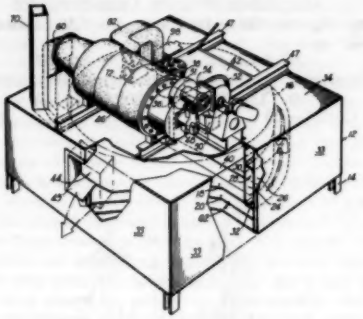
U.S. Cl. 432—13 **10 Claims**

1. A method for dehydrating waste material comprising the steps of placing the material in a substantially closed vessel and simultaneously:

agitating the material;

admitting preheated air to the vessel;

drawing the air and moisture and gases evolved from the material in the vessel into an incinerator; and



passing the gases of combustion from the incinerator in proximity to the vessel to heat the material.

4,441,881
DETERGENT COMPOSITIONS CONTAINING ETHOXYLATED FATTY ALCOHOLS WITH NARROW ETHYLENE OXIDE DISTRIBUTIONS

Ronald M. Ruppert, Moonachie, and Tamara Padron, Union City, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,085
Int. Cl.³ C11D *1/72, 3/37*; B08B *3/00*
U.S. Cl. 8—137 **3 Claims**

1. A process for the spray-dry manufacture of a detergent composition wherein tower smoke is reduced comprising:

(i) forming an azueous mixture containing:

(a) about 7 to about 15% by weight of a nonionic surfactant formed from C_{12-18} fatty alcohols ethoxylated with about 10 to about 14 moles of ethylene oxide and containing a narrow ethylene oxide distribution characterized in that at least 70% by weight of the surfactant contains polyethoxy groups which are within about 3 ethoxy groups of the average number of ethylene oxide units and that less than 5% of the ethoxylate mixture comprises 6 or less ethylene oxide molecules per alcohol molecule further characterized by exhibiting a smoke point of 321° F. or higher;

(b) an effective amount to impart a soil shield up to about 1.0% of a modified cellulose ether selected from the group consisting of alkyl cellulose, hydroxyalkyl cellulose, hydroxyalkyl alkyl cellulose ethers and mixtures thereof;

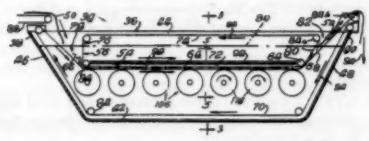
(c) the balance, detergency adjunct materials; and

(ii) spray drying said mixture to produce a detergent powder.

4,441,882
CONTINUOUS LAUNDERING METHOD

Paul H. Gallagher, 2530 Crawford Ave., Evanston, Ill. 60201

Continuation-in-part of Ser. No. 141,952, Apr. 21, 1980, Pat. No. 4,361,018. This application May 5, 1982, Ser. No. 374,935
Int. Cl.³ D06F *15/00*
U.S. Cl. 8—150 **8 Claims**



1. A method of laundering goods comprising the steps,

conveying the goods immersed in and through water in a tank, and confining them in a predetermined path by means other than the tank, and so confining them in such manner as to enable water to pass into and out of them virtually unrestrictedly, and

agitating the goods while they are so conveyed and confined, by imposing force against the goods from one side thereof and providing a physical reaction on the opposite side against the force, and moving the force a substantial distance relative to the thickness of the goods so as to compact the goods against the reaction, and

so imposing the force, and reaction, intermittently and repeatedly and at speed intervals along the path and withdrawing the force after each such imposition, and thereby rendering the periods of such imposition of momentary extent.

4,441,883
DYEING METHOD FOR CONTROL OF MULTICOLORED PATTERN NYLON CARPET

Louis M. Vavala, Colonial Heights, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 11, 1981, Ser. No. 301,343
Int. Cl.³ D06P *5/15*
U.S. Cl. 8—457 **8 Claims**

1. In the method of dyeing nylon carpet in a pattern, the improvement comprising a continuous, wet-on-wet process of

adding a reducing agent selected from the group consisting of zinc formaldehyde sulfoxylate, sodium formaldehyde sulfoxylate, mixtures thereof and thiourea dioxide with a mixture of two or more dyes selected from the group consisting of acid, direct, disperse, fiber reactive and mixtures thereof; and an activator for the reducing agent wherein the activator is a salt, either acid or alkaline, then dyeing and without drying,

steaming the dyed carpet to make dyed patterns that are reproducible, controlled differential multicolorations,

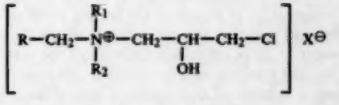
each of said dyes being selected for its known characteristic behavior with the activated reducing agent, whether completely unaffected, partially affected or completely destroyed, and each dye being applied at a time during the dyeing so that its characteristic effect produces the desired multicoloration effect wherein each tuft has differential multicoloration along its length.

4,441,884
QUATERNARY AMMONIUM COMPOUNDS AND THEIR USE AS DYEING ASSISTANTS FOR POLYAMIDE FIBERS

Hans-Peter Baumann, Ettingen, and Urs Mosimann, Oberwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 856,395, Dec. 1, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,211
Claims priority, application Switzerland, Dec. 7, 1976, 15355/76
Int. Cl.³ C09B *62/00*
U.S. Cl. 8—542 **17 Claims**

1. A process for treating a polyamide textile substrate to increase the affinity thereof for anionic dyes or to reserve the same against cationic dyes comprising applying thereto, in a weakly alkaline medium, a compound of formula I,



I

wherein

R is phenyl; naphthyl; (C_{5-6})cycloalkyl; or phenyl or naphthyl substituted by a total of up to 3 substituents selected from the group consisting of (C_{1-4})alkyl, chlorine and bromine (maximum of two of each of these);

each of R_1 and R_2, independently, is (C_{1-4})alkyl, and $X^{\ominus}$ is a non-chromophoric anion.

4,441,885

ANTICREASE FINISHING COMPOSITION AND USE THEREOF IN THE DYEING OR WHITENING OF TEXTILE MATERIAL WHICH CONTAINS POLYESTER FIBRES

Heinz Abel, Reinach, and Paul Schäfer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,761

Claims priority, application Switzerland, Apr. 29, 1981, 2781/81

Int. Cl.³ D06P *1/642, 1/613, 1/16*

U.S. Cl. 8—603 **19 Claims**

1. A non-foaming anticrease finishing composition for dyeing or whitening textile material which contains polyester fibres, which composition comprises at least

(A) an O-cyanoethylated compound of the formula

$$R(O—CH_2CH_2CN)_n \quad (1)$$

wherein R is an n-valent aliphatic, cycloaliphatic or araliphatic radical, and n is 1 to 5, and

(B) a carboxylated polypropylene oxide adduct, or salt thereof, which adduct is obtained from

(a) 1 to 3 moles of an aliphatic diol having an average molecular weight of at most 2600,

(b) 2 to 4 moles of an aliphatic dicarboxylic acid, or anhydride thereof, containing 4 to 10 carbon atoms,

(c) 1 mole of an adduct of propylene oxide and an at least trihydric aliphatic alcohol containing 3 to 10 carbon atoms, and

(d) 0.5 to 2 moles of a fatty acid containing 8 to 22 carbon atoms.

4,441,886

PROCESS FOR REMOVING ORGANIC SULPHUR FROM COAL AND MATERIAL RESULTING FROM THE PROCESS

Charles B. Muchmore, Carbondale; Juh W. Chen, Murphysboro, and Kenneth E. Tempelmeyer, Carbondale, all of Ill., assignors to Southern Illinois University Foundation, Carbondale, Ill.

Filed Nov. 22, 1982, Ser. No. 443,544

Int. Cl.³ C10L *9/02, 9/08*

U.S. Cl. 44—15 R **20 Claims**

1. A process for removing organic sulphur from coal comprising the steps of: mixing coal with ethanol, raising the temperature and pressure of the coal ethanol mixture to above the critical temperature and pressure of the ethanol, holding the coal ethanol mixture at the moderate temperature and elevated pressure for a period sufficient to allow the sulphur in the coal to react with the ethanol, and separating the resultant fluids from the coal solids.

19. A process for removing organic sulphur from coal comprising the steps of: reducing the coal to granules having a size between −10 and +100 standard mesh, heating the coal granules to a temperature in excess of the boiling point of water, holding the coal granules at a temperature above the boiling point of water to drive off substantially all of the water contained in the coal granules, mixing the dried coal granules with ethanol into a mixture of coal granules and ethanol having between 22% and 61.7% solids, heating the mixture of coal granules and ethanol to a temperature of at least 244°0 C., applying a pressure to the mixture of coal granules and ethanol to in excess of 927 psia, cooling the mixture of coal granules and ethanol, and separating the resulting liquid from the remaining solids.

20. A solid coal product made in accordance with the process of claim 19.

4,441,887

STABILIZED SLURRY AND PROCESS FOR PREPARING SAME

James E. Funk, Alfred Station, N.Y., assignor to Alfred University Research Foundation Inc., Alfred, N.Y.

Continuation-in-part of Ser. No. 288,737, Jul. 31, 1981, which is a continuation-in-part of Ser. No. 88,815, Oct. 26, 1979, Pat. No. 4,282,006, which is a continuation-in-part of Ser. No. 957,166, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,337, Apr. 25, 1977, abandoned. This application May 5, 1982, Ser. No. 375,183

The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **31 Claims**

1. A carbonaceous compact comprising finely divided solid carbonaceous particles, wherein:

(a) said compact has a specific surface area of from about 0.8 to about 4.0 square meters per cubic centimeter and an interstitial porosity of less than about 20 volume percent;

(b) from about 5 to about 70 weight percent of said solid carbonaceous particles are of colloidal size, being smaller than about 3 microns;

(c) said compact of finely divided solid carbonaceous particles has a particle size distribution substantially in accordance with the following formula:

$$\frac{CPFT}{100} = \sum_{j=1}^{k} \left[X_j \left(\frac{D^{N_j} - D_{sj}^{N_j}}{D_{Lj}^{N_j} - D_{sj}^{N_j}} \right) \right]$$

where $\sum_{j=1}^{k} X_j = 1.0$

and where if $D < D_{sj}$ $\left(\frac{D^{N_j} - D_{sj}^{N_j}}{D_{Lj}^{N_j} - D_{sj}^{N_j}} \right) = 0.0$

and where if $D > D_{Lj}$ $\left(\frac{D^{N_j} - D_{sj}^{N_j}}{D_{Lj}^{N_j} - D_{sj}^{N_j}} \right) = 1.0$

wherein:

1. CPFT is the cumulative percent of said solid carbonaceous material finer than a certain specified particle size D, in volume percent;
2. k is the number of component distributions in the compact and is at least 1;
3. X_j is the fractional amount of the component j in the compact, is less than or equal to 1.0, and the sum of all of the X_j's in the consist is 1.0;
4. N is the distribution modulus of fraction j and is greater than about 0.001;
5. D is the diameter of any particle in the compact and ranges from about 0.05 to about 1180 microns;
6. D_s is the diameter of the smallest particle in fraction j, as measured at 1% CPFT on a plot of CPFT versus size D, is less than D_L, and is greater than 0.05 microns; and
7. D_L is the diameter of the size modulus in fraction j, measured by sieve size or its equivalent, and is from about 15 to about 1180 microns; and

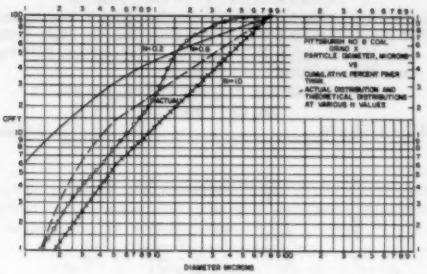
(d) at least 85 weight percent of the carbonaceous particles in the compact have a particle size less than 300 microns.

4,441,888

COAL-WATER SLURRY VISCOSITY REDUCTION USING OLEFIN/MALEIC ACID SALT COPOLYMERS

Joseph Matt, Downers Grove, and John M. Ferrara, Palos Heights, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed May 21, 1982, Ser. No. 380,488
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 4 Claims



1. An improved coal-water slurry of the type comprising at least 45% by weight of finely divided coal particles and a dispersing agent, said slurry being characterized as having a Brookfield viscosity at 60 rpm of less than 4,000 centipoise, the improvement which comprises adjusting the pH of said slurry to at least 6 and using as the dispersing agent, a water-soluble salt of an olefin/maleic acid copolymer having a molecular weight within the range of about between 3,000–50,000.

4,441,889

COAL-AQUEOUS MIXTURES

Seymour Mark, Northampton, Pa., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 230,062, Jan. 29, 1981, abandoned. This application Sep. 10, 1982, Ser. No. 416,606
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 23 Claims

1. A method for forming a coal-aqueous mixture, said method comprising the steps of:

(i) admixing a polyalkyleneoxide nonionic surfactant having a hydrophobic portion and a hydrophilic portion, said hydrophilic portion being comprised of at least about 100 units of ethylene oxide, with water, under low speed agitation conditions;

(ii) admixing particulate coal with the admixture resulting from step (i) under medium speed agitation conditions; and

(iii) agitating the resultant coal containing mixture of step (ii) under high speed agitation.

4,441,890

METHOD FOR IMPROVING STABILITY OF RESIDUAL FUEL OILS

Nicholas Feldman, Woodbridge, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 29, 1982, Ser. No. 428,372
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 10 Claims

1. In the method of inhibiting or reducing the level of asphaltic sediment formed in residual fuel oils by adding an alkylaryl sulfonic acid stabilizer having from about 10 to about 70 carbon atoms to said fuel, the improvement comprising adding an effective stabilizing amount of said alkylaryl sulfonic acid stabilizer to said fuel oil and maintaining said stabilized fuel at a temperature of at least about 190° C. for a time sufficient to inhibit the formation or reduce the level of asphaltic sediment that forms or separates out.

4,441,891

GASOLINE-AIDED PRODUCTION OF ALCOHOL AND FUEL

Ernest R. Roth, Villanova, Pa., assignor to Biohol Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 217,703, Dec. 18, 1980. This application Dec. 18, 1981, Ser. No. 332,219
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ C10L 1/02
U.S. Cl. 44—56 15 Claims

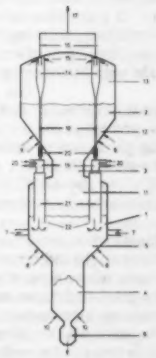
1. In solvent extraction of alcohol from alcohol/water mixtures with predominantly alcoholic solvent, the improvement comprising adding gasoline in minor amount to the organic extract, settling out an aqueous underlayer, and removing an enriched organic overlayer.

4,441,892

PROCESS FOR THE GASIFICATION OF CARBONIFEROUS MATERIAL IN SOLID, PULVERULENT OR EVEN LUMP FORM

Ernst Schuster, Gummersbach, Fed. Rep. of Germany, assignor to Carbon Gas Technologie GmbH, Ratingen, Fed. Rep. of Germany

Continuation of Ser. No. 208,821, Nov. 20, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 406,357
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1979, 2947222
Int. Cl.³ C10J 3/16, 3/46, 3/54
U.S. Cl. 48—197 R 7 Claims



1. Process for the gasification of carbonaceous material in solid form, with at least oxygen, at pressures from 1 to approximately 80 bar in a fluidized bed, the process comprising the steps of: arranging two fluidized bed gasification stages above each other in a reaction chamber and connecting said two stages to each other; supplying carbonaceous material and oxygen to the lower fluidized bed and supplying gasifying agent to the upper fluidized bed,; separating solids containing pure substance and ash from gas leaving the upper fluidized bed; supplying the separate solids to at least one flue-dust gasification chamber via a gasification burner said flue-dust gasification chamber being arranged substantially entirely inside said reaction chamber and extending from a location between said lower and upper fluidized beds downwardly into and below the upper surface of the lower fluidized bed and with the upper portion of the flue-dust gasification chamber being connected to a mounted gasification burner located outside the reaction chamber said flue-dust gasification cham-

ber having a size for allowing adequate time for both carbon conversion and ash melting; at least one flue-dust gasification chamber releasing as products gas and liquid slag into the lower fluidized bed; a direct heat release taking place from said products to the lower fluidized bed; the liquid slag solidifying in the fluidized bed and precipitating at the bottom as a granulate into a fixed bed gasification stage underneath the fluidized bed stages.

4,441,893

ENHANCED CARBON MONOXIDE UTILIZATION IN METHANATION PROCESS

Louis F. Elek, Peekskill, and Albert C. Frost, Congers, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 224,441, Jan. 12, 1981, abandoned. This application Nov. 5, 1982, Ser. No. 439,635

Int. Cl.³ C10K *3/04*

U.S. Cl. 48—197 R **15 Claims**

1. A cyclic process for the production of methane from carbon monoxide-containing gas streams comprising:

(a) passing a carbon monoxide-containing feed gas stream over a catalyst present in a metal state and capable of catalyzing the disproportionation of carbon monoxide at a temperature of from about 100° C. to about 350° C. and a pressure of from about 1 to about 10 atmos., said feed gas stream having a hydrogen concentration of from about 5% to about 100% by volume based on the volume of CO present in said stream, and being passed over the catalyst for a time sufficient to deposit a surface layer of active surface carbon on the catalyst essentially without the formation of inactive coke on the catalyst, the residence time of the feed gas stream in the presence of the catalyst being sufficiently short so as to enable hydrogen present in said feed gas stream to react with the carbon monoxide content of said feed gas stream to form additional active surface carbon essentially without the formation of methane by the less rapid reaction of active surface carbon or carbon monoxide with hydrogen present in the feed gas stream;

(b) contacting said layer of active surface carbon deposited on said catalyst present in the metal state with steam, a steam-containing gas stream or hydrogen at a pressure of from about 1 to about 100 atmos., and a temperature of from about 100° C. to about 400° C., thereby converting said active surface carbon to methane and carbon dioxide; and

(c) passing additional carbon monoxide-containing gas over said catalyst from step (b) and repeating said steps (a) and (b) on a cyclic basis, whereby relatively pure methane can conveniently be produced from carbon monoxide-containing gas streams on a cyclic basis, the presence of said hydrogen at the relatively low disproportionation pressures employed in step (a), for said short residence time, surprisingly enhancing the effective CO utilization and the overall technical-economic feasibility of the methanation process.

4,441,894

COATED COMPOSITE SILICON NITRIDE CUTTING TOOLS

Vinod K. Sarin, Lexington, and Sergej-Tomislav Buljan, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 26, 1983, Ser. No. 536,110

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—295 **9 Claims**

1. A coated composite ceramic cutting tool comprising a densified composite silicon nitride substrate having at least one intermediate adherent refractory coating layer and an outer adherent alumina coating layer;

said substrate body consisting essentially of particles of a hard refractory material uniformly distributed in a matrix consisting essentially of a first phase of silicon nitride and a refractory second phase comprising silicon nitride and an effective amount of a densification aid selected from the group consisting of yttrium oxide, hafnium oxide, the lanthanide rare earth oxides, and mixtures thereof.

4,441,895

PROCESS FOR THE SEPARATION OF MIXTURES BY MEANS OF MASS TRANSFER AT DIFFERENT TEMPERATURES OR PRESSURES

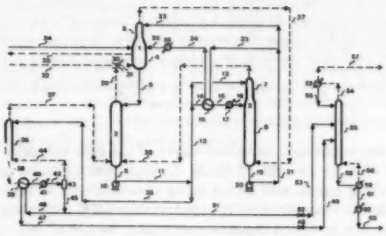
Ludwig Silberring, Limmattalstrasse 266, Zürich, Switzerland

PCT No. PCT/CH81/00041, 371 Date Dec. 11, 1981, 102(e) Date Dec. 11, 1981, PCT Pub. No. WO81/02985, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 13, 1981, Ser. No. 328,576

Int. Cl.³ C01C *1/10*

U.S. Cl. 55—70 **5 Claims**



1. A process for the selective ab-respectively desorption of gaseous syngas components in, respectively out of liquid ammonia, comprising:

providing a closed circuit for the flow of two mass streams each of one or more components;

providing a first reaction chamber having first and second physically separated input ports and first and second physically separated output ports;

applying two input mass streams in different respective phases within said closed circuit to said reaction chamber at respective ones of said first and second reaction chamber input ports to produce counter current flow of one input mass stream with respect to the other input mass stream within a region of said reaction chamber;

withdrawing two output mass streams in different respective phases from respective ones of said first and second output ports subsequent to the counter current flow of said phases;

maintaining a temperature or pressure gradient within said reaction chamber sufficient to cause at least one third of at least one component of each input mass stream to change its phase in the region of counter current flow thereby producing said output mass streams each differing in content from the input mass stream of the corresponding phase.

4,441,896

PROCESS FOR RECOVERING ORGANIC SUBSTANCES FROM SPENT AIR VAPORS

Rolf Bentz, Basel, and Christian Schori, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,234

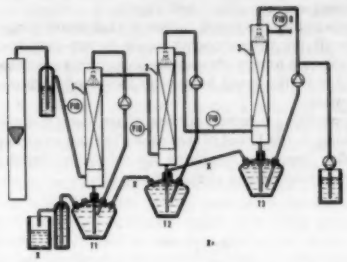
Claims priority, application Switzerland, Sep. 18, 1981, 6044/81

Int. Cl.³ B01D *47/06*

U.S. Cl. 55—85 **6 Claims**

1. A process for recovering nitrobenzene, dichlorobenzene or trichlorobenzene from spent air vapours by absorption, which process comprises passing spent air vapours containing these organic substances through an organic liquid which has

a high boiling point and is homogeneously miscible with water, absorbing said organic substances therein, subsequently adding water to the absorbent organic liquid, forming a lower phase of



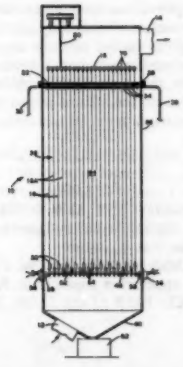
organic substance and an upper phase of absorbent/water solution and separating and recovering the organic substances from the absorbent/water mixture.

4,441,897

WET ELECTROSTATIC PRECIPITATOR HAVING REMOVABLE NESTED HEXAGONAL COLLECTOR PLATES AND MAGNETIC ALIGNING AND RAPPING MEANS

Charles E. Young, and George Drzewiecki, both of Ontario, Canada, assignors to Inco Limited, Toronto, Canada

Filed Feb. 12, 1982, Ser. No. 348,221
Claims priority, application Canada, Sep. 30, 1981, 386980
Int. Cl.³ B03C *3/76*
U.S. Cl. 55—112 **11 Claims**



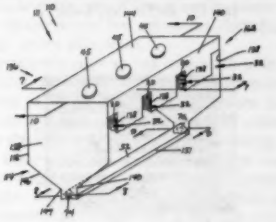
1. An electrostatic precipitator, the precipitator comprising a shell, gas inlet and outlet ducts in fluid flow communication with the shell, a plurality of discharge electrodes and collecting electrodes disposed within the shell, an upperframe for suspending the discharge electrodes within the shell, the upper frame insulatingly supported by the shell, a lower frame supported from the upper frame by at least some of the discharge electrodes, means for supporting the collecting electrodes, a plurality of fluid sprayers disposed above the collecting electrodes, the collecting electrodes forming a honeycombed pattern of repeating, hexagonal collecting zones within the precipitator, the collecting electrodes including a plurality of long plates having two opposing sixty degree bends formed along the two longitudinal edges of each plate, each bent edge of each plate registered with two similar longitudinal edges from two similarly formed adjacent collecting electrodes to form a self-nesting, equiangled, Y-shaped intersection point and the resultant honeycombed pattern of repeating, hexagonal collecting electrodes throughout the precipitator, and a discharge electrode disposed within each collecting electrode.

4,441,898

DISCHARGE APPARATUS FOR REMOVING GRANULAR FILTER MATERIAL FROM A FILTER HOUSING AND A FILTER APPARATUS HAVING SAME

Alan E. Revell, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Continuation of Ser. No. 808,915, Jun. 22, 1977, abandoned.
This application Apr. 2, 1981, Ser. No. 250,492
Int. Cl.³ B01D *46/34, 50/00*
U.S. Cl. 55—350 **9 Claims**



1. A filter apparatus comprising:

(a) a filter housing having opposing upstream and downstream walls andd a pair of opposing side walls interconnecting the upstream and downstream walls including:

(1) a gas treating enclosure having a plurality of dirty gas inlet apertures in the upstream wall and a plurality of clean gas outlet apertures in the downstream wall;

(2) a hopper portion disposed below and open to the interior of the gas treating enclosure having a pair of downwardly converging sloping walls extending from the opposing upstream and downstream walls between the side walls; and,

(3) elongated trough means extending completely across the hopper portion and being open to the interior of the hopper portion along its entire length;

(b) means defining a plurality of filter cells adapted to be filled with a granulated gas treating material disposed within the gas treating enclosure of the filter housing such that gas to be cleaned passes through one of said filter cells before exiting through one of said clean gas outlet apertures, said filter cell defining means being open to the hopper portion of the filter housing so that when the filter cell defining means are filled with granulated gas treating material, granulated gas treating material will fall into the hopper portion of the filter housing;

(c) an elongated baffle plate secured to the side walls spaced above the bottom of the elongated trough means and extending completely across the hopper portion and cooperating with the elongated trough means to define an elongated gas treating material conveying channel within and extending completely across the hopper portion of the filter housing, the longitudinal edges of the elongated baffle plate being spaced from the sides of the elongated trough means to define two parallel elongated slots between the longitudinal edges of the elongated baffle plate and the sides of the elongated trough means which are of uniform width and extend parallel to the longitudinal axis of the elongated trough means so that the gas treating material conveying channel is open to the interior of the hopper portion of the filter housing only along the longitudinal edges of the elongated baffle plate;

(d) a conveying gas inlet aperture in one of the side walls opening into the gas treating material conveying channel at one end of the gas treating material conveying channel;

(e) a gas treating material and conveying gas outlet aperture in the other side wall opening into the other end of the gas

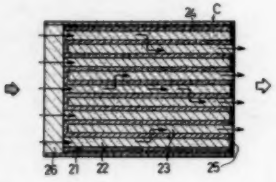
treating material conveying channel, said gas treating material and conveying gas outlet aperture being larger in cross-sectional area than said conveying gas inlet aperture to promote progressive aspiration of treating material from the interior of the hopper portion along the conveying channel commencing at the end of the channel proximate the conveying gas inlet aperture.

4,441,899

DUST COLLECTING FILTER

Shigeru Takagi, and Masahiro Tomita, both of Anjo, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 15, 1981, Ser. No. 331,063
Claims priority, application Japan, Dec. 30, 1980, 55-187519
Int. Cl.³ B01D *39/20, 46/52*
U.S. Cl. 55—485 **7 Claims**



1. A filter for collecting dust contained in a flowing fluid, comprising:

a tubular casing for flow therethrough of fluid containing dust;

a thin-walled first filter member snugly disposed within said casing and having a zigzag configuration in a plurality of angularly spaced longitudinal sections defining a plurality of longitudinal flow passages, alternate of said passages being inlet passages having their upstream ends open and their downstream ends closed and the remainder of said passages being outlet passages having their upstream ends closed and their downstream ends open;

a second filter member snugly charged within said inlet passages;

a third filter member snugly charged within said outlet passages; and

a fourth filter member snugly charged within said casing upstream of said second filter member and covering said open ends of said inlet passages and said closed ends of said outlet passages;

all of said filter members being formed of foamed ceramic material having interconnecting pores, the pores of said second and third filter members being larger than the pores of said first filter member and the pores of said fourth filter member being larger than those of said first filter member and smaller than those of said second filter member.

4,441,900

METHOD OF TREATING CARBON-DIOXIDE-CONTAINING NATURAL GAS

Brian R. Swallow, Media, Pa., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 25, 1982, Ser. No. 381,846
Int. Cl.³ F25J *3/04*
U.S. Cl. 62—29 **3 Claims**

1. A method for separating carbon dioxide from a carbon-dioxide-containing natural gas mixture having a high carbon dioxide content comprising:

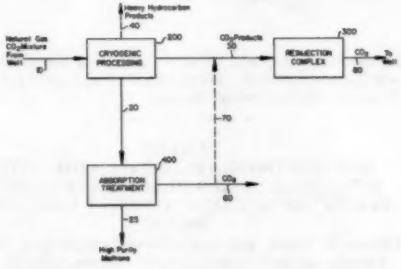
(1) providing a natural gas mixture containing about 10 to 70% methane and having a carbon dioxide content of 30 to 90 mol percent and liquefying a major portion of the carbon dioxide in the natural dioxide in the natural gas mixture by cooling the gas mixture, at an elevated pressure above about 700 psig,

(2) thereafter separating the cooled natural gas mixture of step (1) into a condensed liquid carbon-dioxide-containing stream and non-condensed vapor,

(3) subcooling the liquid carbon-dioxide-containing stream,

(4) rectifying the subcooled liquid carbon-dioxide-containing stream to provide methane-containing overhead vapor and a kettle liquid having an increased carbon dioxide content,

(5) vaporizing a minor portion of the carbon-dioxide-containing kettle liquid of step (4) by heating so as to provide reflux vapor for rectifying the subcooled liquid carbon-dioxide-containing stream of step (4),



(6) separating a carbon-dioxide-enriched liquid from the vapor of step (5),

(7) combining the methane-containing overhead vapor separation of step (4) with the non-condensed vapor separated in step (2) to provide a methane-containing gas mixture,

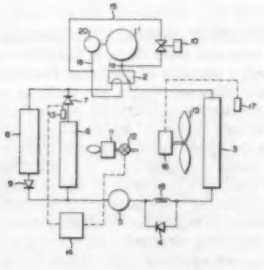
(8) cooling the methane-containing gas mixture of step (7) and rectifying the cooled mixture to provide a methane-enriched overhead vapor and a kettle liquid containing carbon dioxide, the steps (1) through (8) being conducted at a pressure below the critical pressure and at a temperature above the triple point temperature for each composition involved.

4,441,901

HEAT PUMP TYPE AIRCONDITIONER

Masakazu Endoh, Osaka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,988
Claims priority, application Japan, Jun. 5, 1981, 56-86682
Int. Cl.³ F25B *13/00, 27/00, 29/00*
U.S. Cl. 62—160 **19 Claims**



1. A heat pump type airconditioner operable in a cooling operation mode, and a warming operation mode employing a refrigerant heated with a heat generation means as a heat source, comprising: compression means to compress the refrig-

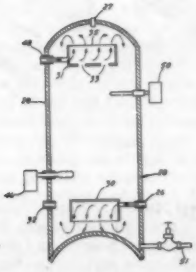
erant, a first heat exchanger which is disposed indoors and which functions as a vaporizer in the cooling operation mode and as a condenser in the warming operation mode, a second heat exchanger which is disposed outdoors and which functions as a condenser in the cooling operation mode, a third heat exchanger which is disposed in parallel with said second heat exchanger and which heats the refrigerant in the warming operation mode, the heat generation means applying heat to said third heat exchanger, a reservoir which stores the excess refrigerant in a pipe line where the refrigerant is in the liquid phase in the cooling operation mode, a pressure reduction mechanism which is disposed between said reservoir and said first heat exchanger and which reduces the pressure of the refrigerant circulating in the cooling operation mode, bypass means around said pressure reduction mechanism to bypass the refrigerant tending to flow to said pressure reduction mechanism in the warming operation mode, first valve means disposed at one end of said second heat exchanger on the reservoir side and functioning so as to cause liquid refrigerant to be stored in said second heat exchanger in the warming operation mode, second valve means disposed at one end of said third heat exchanger on the compression means side and functioning so as to prevent the refrigerant from flowing through said third heat exchanger in the cooling operation mode, first temperature detection means adjacent the refrigerant outlet of said third heat exchanger to sense the temperature of the refrigerant heated in said third heat exchanger in the warming operation mode, blowing means disposed in correspondence with said first heat exchanger and blowing cold air and warm air from said first heat exchanger into a room in the cooling and warming operation modes respectively, second temperature detection means adjacent said first heat exchanger to sense the temperature of the air blown over said first heat exchanger in the warming operation mode, and control means connected to the respective temperature detection means to stop operation of said heat generation means in the warming operation mode when the refrigerant temperature detected by said first temperature detection means has exceeded a predetermined value and also to regulate a rate of flow of the air from said blowing means in dependence on the air temperature detected by said second temperature detection means.

4,441,902

HEAT RECLAIMING METHOD AND APPARATUS

Douglas M. Jardine, Colorado Springs, Colo., assignor to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed Feb. 2, 1982, Ser. No. 344,984
Int. Cl.³ F25B 27/02
U.S. Cl. 62—238.6 **2 Claims**



1. A combination hot water heater, refrigerant desuperheater assembly for use in conjunction with a refrigeration circuit in a hot water system which comprises:

a water inlet for receiving water to be heated;

a refrigerant inlet for receiving the refrigerant;

a water outlet for discharging water;

a refrigerant outlet for discharging refrigerant;

heat exchange means for transferring heat energy between the refrigerant and the water, said heat exchange means being connected to the refrigerant inlet and the refrigerant outlet;

pump means having an inlet and an outlet, with the outlet connected to the water inlet for circulating water through the assembly;

first pipe means connecting the pump means to the heat exchange means;

second pipe means connecting the heat exchange means to the water outlet;

a first valve means associated with the first pipe means, said valve having an open position allowing waterflow from the water inlet to the heat exchange means and a closed position preventing waterflow from the water inlet to the heat exchange means but permitting flow from the heat exchange means to a drain;

a one way second valve means associated with the second pipe means, said valve having an open position allowing waterflow from the heat exchange means to the water outlet and a closed position preventing waterflow from the heat exchange means to the water outlet; and,

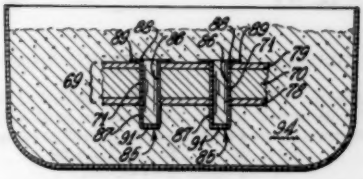
including a hot water storage tank having at least one inlet and one outlet with an outlet thereof connected to the pump inlet and an inlet thereof connected to the water outlet wherein the storage tank includes a cold water inlet and a hot water outlet, wherein the cold water inlet is connected to a cold water expanding inlet nozzle positioned within the tank and the hot water outlet is connected to a hot water expanding inlet nozzle positioned within the tank.

4,441,903

METHOD OF MAKING GLASS FIBER FORMING FEEDERS AND FEEDER FORMED THEREBY

Mohinder S. Bhatti, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 22, 1982, Ser. No. 452,273
Int. Cl.³ C03B 37/095
U.S. Cl. 65—1 **17 Claims**



1. A method of forming an orificed discharge wall for a feeder for supplying molten streams of glass to be attenuated into filaments comprising:

inserting elements in apertures in a member;

immersing said member containing said elements in a bed of particles of water soluble glass;

heating said bed of particles under a vacuum to fuse said particles to hermetically seal said member and elements in a high temperature resistant and pressure transmittable coating of water soluble glass and to remove residual gases from between said member and elements;

hot isostatically pressing said hermetically sealed member and elements to intimately bond the elements to said member;

contacting the coating with water to remove said coating; and

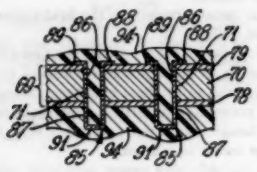
forming an orifice in said elements to permit the passage of molten glass therethrough to establish said streams.

4,441,904

METHOD OF MAKING GLASS FIBER FORMING FEEDERS AND FEEDER FORMED THEREBY

Mohinder S. Bhatti, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 20, 1983, Ser. No. 486,777
Int. Cl.³ C03B 37/095
U.S. Cl. 65—1 11 Claims



11. A feeder for supplying molten streams of glass to be drawn into filaments comprising:

a member having a plurality of elements positioned in apertures therein said elements being mechanically sealed to said member by cold isostatic pressing;

sidewall sections extending upwardly from said member; and

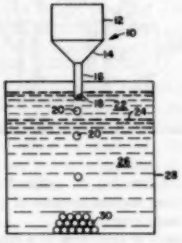
end wall sections extending upwardly from said member, said member, sidewall sections, and end wall sections being joined together in the absence of heating said member and elements to fuse the elements and member together.

4,441,905

METHOD OF FORMING CERAMIC BODIES

Joseph W. Malmendier; Carol F. Pride, both of Big Flats; Randy L. Rhoads, Horseheads; Robert J. Schlaufman, Elmira, and Robert D. Shoup, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,684
Int. Cl.³ C03B 19/10
U.S. Cl. 65—21.3 30 Claims



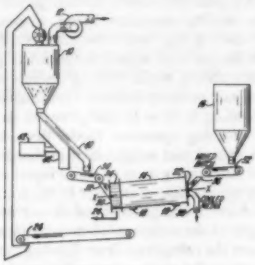
1. A method of producing low density ceramic bodies from a gel containing dispersed crystals from a synthetic, water-swelling, lithium and/or sodium mica, the crystals being selected from the group of fluorhectorite, hydroxyl hectorite, boron fluorphlogopite, hydroxyl boron phlogopite, and solid solutions among those and between those and other structurally-compatible species selected from the group of talc, fluortalc, fluorpolylithionite, polylithionite, phlogopite, and fluorphlogopite, which comprises releasing droplets of the gel to form shaped bodies, effecting an exchange of large cations from an external source with lithium and/or sodium ions from the mica crystals, and draining and drying the ion-exchanged bodies thus formed.

4,441,906

METHOD OF PREHEATING GLASS BATCH

Mark A. Propster, Gahanna; Stephen Seng, Bladensburg, and Charles M. Hohman, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 28, 1982, Ser. No. 437,243
Int. Cl.³ C03B 1/00
U.S. Cl. 65—27 10 Claims



1. A process for producing glass by charging to a melting furnace and melting therein a particulate glass batch, including the steps of:

heating the durable heat transfer media, larger in particle size than the glass batch, by direct contact with exhaust gases from the melting furnace wherein the direct contact with furnace gases coats the media with a condensate;

heating the glass batch by direct contact with the hot media; and

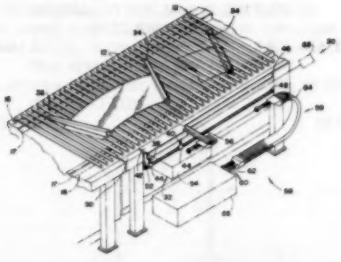
cleaning the media by heating them to a temperature that will melt the condensate from the media.

4,441,907

APPARATUS AND METHOD FOR LOCALLY HEATING CONVEYED GLASS SHEETS

John S. Nitschke, Perrysburg, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Filed Aug. 20, 1982, Ser. No. 410,100
Int. Cl.³ C03B 23/02
U.S. Cl. 65—106 14 Claims



1. In a glass sheet bending system including a heating chamber, a conveyor for conveying glass sheets through the heating chamber from an upstream position to a downstream position for heating to a sufficiently high temperature for bending, and a bending station for bending heated glass sheets, the improvement comprising:

a localized heater mounted for movement relative to and independent of the conveyed glass sheet for providing localized heating of each glass sheet transverse the direction of conveyance as the glass sheet moves from the upstream position to the downstream position; and

an actuator for moving the heater to track each glass sheet in

the direction of conveyance from the upstream position to the downstream position.

6. In a glass sheet bending system including a conveyor for conveying glass sheets through a heating chamber from an upstream position to a downstream position for heating to a sufficiently high temperature for bending, and a bending station for bending heated glass sheets, a method for facilitating the bending of a strip portion of each glass sheet extending transverse the direction of conveyance without interrupting movement of the glass sheets, the method comprising:

tracking the strip portion of each of the conveyed glass sheets between the upstream position and the downstream position on the conveyor with a localized heater movable relative to and independent of the conveyed glass sheet so that the localized heater heats the strip portion to a temperature higher than the temperature of the rest of the glass sheet prior to bending at the bending station.

4,441,908

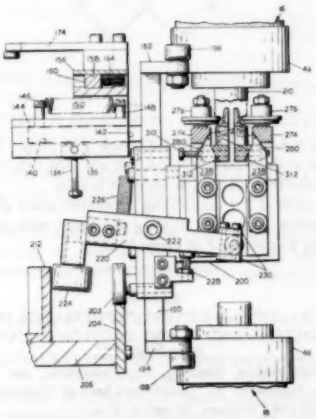
VIAL TOOLING APPARATUS

Otto Zanner, Vineland, N.J., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 248,790, Mar. 30, 1981, abandoned. This application Aug. 25, 1982, Ser. No. 411,717

Int. Cl.³ C03B *23/04, 23/09*

U.S. Cl. 65—109 **24 Claims**



1. A machine for working-end adjacent regions of thermoplastic material preforms such as glass preforms, comprising, in combination, a rotatable carousel having a plurality of pairs of vertically aligned upper and lower chucking assemblies disposed adjacent the periphery of said carousel and defining a respective plurality of vertical axes of rotation, each of said chucking assemblies having a collar defining an axis coaxial with said respective axis of rotation, means for rotating said carousel and said chucking assemblies, at least one tooling carriage positioned generally adjacent the periphery of said carousel, said tooling carriage including a drive sprocket and an idler sprocket rotatably mounted on said carriage, a chain disposed about said drive and idler sprockets, and a plurality of tooling stations secured to said chain for movement about the periphery of said tooling carriage, said plurality of tooling stations each including a pair of upper and a pair of lower means for engaging a respective one of said collars on said upper and lower chucking assemblies, a first pair of pivotally supported arms each arm having a respective forming roller rotatably secured thereto, a second pair of pivotally supported arms each arm having a segment of a mandrel secured thereto, and cam means disposed adjacent said first and said second pair of arms for pivoting said first pair of arms apart while pivoting said second pair of arms together and pivoting said first pair of arms together while pivoting said second pair of arms apart.

22. A method of forming the finish portion of a glass vial or similar article comprising the steps of:

(a) for each of a plurality of articles:

providing an article in a workable condition;

providing a pair of spaced apart chucks disposed for rotation on a common vertical reference axis, each of said chucks having a collar secured thereto and disposed coaxially with said vertical reference axis;

constraining said article in said chucks, and

rotating said article about its length axis while said article is constrained in said chucks;

(b) for each of a plurality of working stations:

providing a working station defining a tooling reference axis and having (1) two pairs of reference rollers, each of said pair of reference rollers disposed for engagement with a respective one of said chuck collars, (2) a segmented mandrel aligned with said tooling reference axis and (3) a pair of forming rollers, each being disposed for roation on an axis parallel to said tooling reference axis;

(c) moving each of said plurality of articles, while constrained in said chucks, around a rotatable carriage periphery to advance each article therearound for tooling finishing,

(d) moving each of said plurality of working stations in proximity to the carriage periphery,

(e) meeting each one of the advancing articles with one of the stations and advancing the station together with the article for and during finishing,

(f) for each such working station and the article it works upon:

moving such working station into proximity with said chucks such that each of said pair of reference rollers engage a respective one of said collars and said vertical reference axis and said tooling reference axis coincide;

inserting the segments of the mandrel of such working station into the article; and

forming the finish portion of the article by engaging the outside of the article with the forming rollers of such working station while expanding the mandrel segments and engaging the inside of such article with the expanded mandrel segments whereby the article is worked to a desired finish.

4,441,909

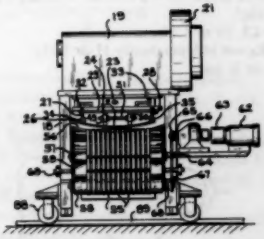
APPARATUS FOR CURVING AND TEMPERING GLASS SHEETS

Harold E. McKelvey, Plymouth; William T. Livingston, Farmington Hills, and Edward D. Sheldon, Detroit, all of Mich., assignors to Shatterproof Glass Corporation, Detroit, Mich.

Filed Jun. 24, 1982, Ser. No. 391,573

Int. Cl.³ C03B *23/03, 35/14*

U.S. Cl. 65—273 **10 Claims**



1. Apparatus for producing curved tempered sheets of glass, including means for heating the glass sheets to softening temperature, means for receiving the softened sheets from said heating means and shaping them to the desired curvature, and

means for receiving the curved sheets from the shaping means and for tempering the same, said shaping means comprising upper and lower shaping members, and a plurality of relatively narrow endless belts arranged in spaced parallel relation and having a substantially horizontal flight for conveying the glass sheets between the shaping members, said lower shaping member having an upper concavely curved shaping surface of a length and width at least equal to those of the glass sheets, with the curvature of said shaping surface being disposed transversely to the line of movement of said belts and the said belts passing over and in contact therewith, means for lowering and raising the upper shaping member, and means for driving said endless belts for receiving the softened glass sheets from the heating means, carrying them over the said shaping surface and subsequently delivering the curved glass sheets to the tempering means.

6. Apparatus for producing curved tempered sheets of glass, including means for heating the glass sheets to softening temperature, means for receiving the softened sheets from said heating means and shaping them to the desired curvature, and means for receiving the curved sheets from said shaping means and for tempering the same, said tempering means comprising a plurality of horizontally arranged conveyor rolls, and means for mounting said rolls such that adjacent rolls cross one another at an angle intermediate their ends to provide a substantially V-shaped saddle for supporting the curved glass sheets.

4,441,910
THIOPHENE OR FURAN HERBICIDES

Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 247,134, Mar. 24, 1981, abandoned. This application Feb. 8, 1982, Ser. No. 345,935

Int. Cl.³ A01N *43/02;* **C07D** *409/12, 405/12*

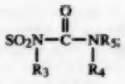
U.S. Cl. 71—90 **50 Claims**

1. A compound of the formula:

wherein

Q is O or S;

A is



R_1 is $R_6S(O)_n$;

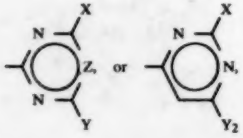
R_6 is C_1–C_4 alkyl, C_3–C_4 alkenyl, cyclopentyl or cyclopropylmethyl;

R_2 is H, Cl, Br or CH_3;

R_3 and R_4 are independently H or CH_3;

n is 0, 1 or 2; and

R_5 is



wherein

X is CH_3 or OCH_3;

Y is H, Cl, CH_3, C_2H_5, OCH_3, OC_2H_5 or CH_2OCH_3;

Y_1 is H, Cl, CH_3 or OCH_3;

Y_2 is CH_3 or OCH_3;

Z is CH;

and their agriculturally suitable salts; provided that:

both R_3 and R_4 may not simultaneously be CH_3, and further provided that R_1 and A are bonded to adjacent carbon atoms of the thiophene or furan ring.

31. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,441,911
HERBICIDAL HETEROCYCLIC PENTALENES

Michael T. Clark, and Ian J. Gilmore, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

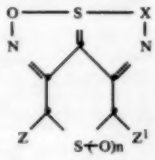
Continuation-in-part of Ser. No. 388,777, Jun. 15, 1982, abandoned. This application Sep. 15, 1982, Ser. No. 418,370

Claims priority, application United Kingdom, Jun. 24, 1981, 8119403

Int. Cl.³ A01N *43/02;* **C07D** *291/08*

U.S. Cl. 71—91 **3 Claims**

1. A compound of the formula



wherein X is O or S, Z and Z^1 each is hydrogen or alkyl of from one to three carbon atoms, and n is zero, one or two, with the proviso that when X is sulfur, n is zero.

2. A method for controlling unwanted plant growth at a locus, which comprises treating the locus with an effective dosage of a compound of claim 1.

4,441,912
N-PYRAZINYL-N-BENZYLCARBAMATES, HAVING FUNGICIDAL AND PLANT GROWTH REGULATING PROPERTIES

Pieter Ten Haken, Eastling, Nr. Faversham, and Shirley B. Webb, Sheldwich, Nr. Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

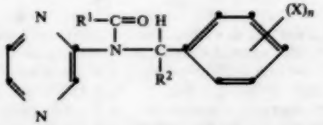
Division of Ser. No. 269,174, Jun. 2, 1981, Pat. No. 4,359,576, which is a continuation-in-part of Ser. No. 164,975, Jul. 1, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,943

Claims priority, application United Kingdom, Jul. 19, 1979, 7925164

Int. Cl.³ A01N *55/02, 43/60;* **C07F** *15/02, 3/04*

U.S. Cl. 71—92 **2 Claims**

1. A method for reducing the growth of a plant which comprises subjecting the plant to an effective dosage of a compound of the formula:



wherein R^1 is hydrogen, or is alkyl, alkoxyalkyl, cycloalkyl or alkylcycloalkyl of up to six carbon atoms, R^2 is hydrogen or alkyl of one to four carbon atoms, X is halogen or alkyl of from one to six carbon atoms and n is one or two, and the horticul-

turally acceptable acid addition salts, and complexes thereof with halides of calcium, copper and iron.

4,441,913

SUBSTITUTED PHENOXYPROPIONATES AND HERBICIDAL COMPOSITIONS

Masahiro Aya, Kodaira; Junichi Saito, Mitaka; Kazuomi Yasui, Tokyo; Kozo Shiokawa, Kawasaki, and Koichi Moriya, Hachioji, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

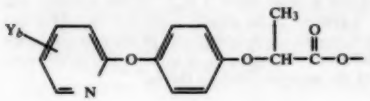
Filed Jun. 17, 1982, Ser. No. 389,525

Claims priority, application Japan, Jun. 25, 1981, 56-97486; Sep. 16, 1981, 56-144778; Dec. 7, 1981, 56-195604; Dec. 7, 1981, 56-195605

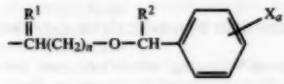
Int. Cl.³ C07D *213/64;* A01N *43/40*

U.S. Cl. 71—94 **21 Claims**

1. A substituted phenoxypropionate of the formula



(I)



in which

R^1 and R^2 each independently is a hydrogen atom or a C_1 to C_6 alkyl group,

X is a hydrogen or halogen atom, a nitro, C_1 to C_6 alkyl or C_1 to C_6 alkoxy group,

a and n each independently is 1 or 2,

Y is a trifluoromethyl group, a halogen atom or a nitro, cyano or C_1 to C_6 alkyl group, and

b is 1 or 2.

18. A method of combating weeds which comprises applying to the weeds, or their habitat, a herbicidally effective amount of a substituted phenoxypropionate according to claim 1.

4,441,914

DICHLOROACETYL OXAZOLIDINE HERBICIDE ANTIDOTES

Charles J. Duerksen, and Benjamin P. Rodriquez, both of Visalia, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

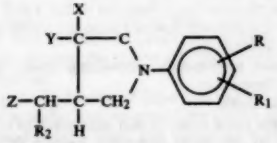
Filed Dec. 30, 1981, Ser. No. 335,950

Int. Cl.³ A01N *25/32*

U.S. Cl. 71—95 **8 Claims**

5. A method of controlling undesirable vegetation and reducing pyrrolidone-type herbicidal crop injury comprising applying to the locus where control is desired a composition comprising:

(a) an herbicidally effective amount of a pyrrolidone compound of the formula



in which

X is hydrogen, chlorine, or methyl;

Y is hydrogen, chlorine or bromine;

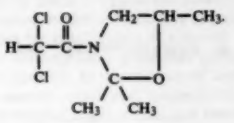
Z is chlorine or bromine;

R is hydrogen, alkyl, acetyl, chloride, bromine, fluorine, iodine, trifluoromethyl, nitro, cyano, alkoxy having 1 to 4 carbon atoms, inclusive, alkylthio having 1 to 4 carbon atoms, inclusive, alkylsulfinyl having 1 to 4 carbon atoms, inclusive, alkylsulfonyl having 1 to 4 carbon atoms, inclusive, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl, pentafluoropropionamide, or 3-methylureido;

R_1 is hydrogen, alkyl having 1 to 4 carbon atoms, inclusive, chlorine or trifluoromethyl; and

R_2 is alkyl having 1 to 4 carbon atoms, inclusive, or hydrogen; and,

(b) a non-phytotoxic antidotally effective amount of a compound of the formula



4,441,915

DIURETHANES AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME

Friedrich Arndt, and Gerhard Boroschewski, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

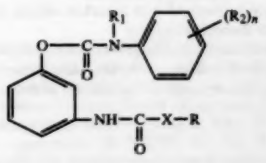
Continuation of Ser. No. 101,051, Dec. 6, 1979, which is a continuation of Ser. No. 925,552, Jul. 17, 1978. This application Jul. 15, 1981, Ser. No. 283,661

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1977, 2732848

Int. Cl.³ A01N *37/44;* C07C *149/43, 125/073, 125/075*

U.S. Cl. 71—100 **4 Claims**

1. Diurethane of the formula



I

N-(2-Methoxyethyl)-carbanilic acid-(3-methoxy carbonylamino)-phenyl-ester, wherein R=CH_3, X=O, R_1=2-methoxyethyl and n=o.

4. A herbicidal composition comprising from about 10 to 80% by weight of at least one diurethane selected from the group consisting of N-(2-Methoxyethyl)-carbanilic acid-(3-methoxy carbonylamino)-phenyl-ester,

N-(2,2-Dimethoxyethyl)-carbanilic acid-(3-methylthiocarbonylamino)-phenyl-ester, and

N-(2-Methoxyethyl)-carbanilic acid-(3-methylthiocarbonylamino)-phenyl-ester, and about 90 to 20% by weight of a liquid or solid inert carrier material with or without up to 20% by weight of a surface active agent upon corresponding reduction of the amount of carrier material.

4,441,916
HALOALKYLOXIME HERBICIDAL ANTIDOTES

Don R. Baker, Orinda, and Arnold D. Gutman, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 19, 1981, Ser. No. 313,057
Int. Cl.³ A01N *37/00, 33/02*
U.S. Cl. 71—100 **4 Claims**

1. The method of protectng corn from injury due to S-ethyl dipropyl thiolcarbamate herbicide, comprising preplant incorporation in the soil in which said corn is to be planted, a nonphytotoxic antidotally effective amount of a compound corresponding to the formula

$$R_2-\underset{\displaystyle R_1}{\overset{}{C}}=NOH$$

wherein R_1 is monochloromethyl and R_2 is monochloromethyl.

4,441,917
HERBICIDAL UREA DERIVATIVES

David A. Griffin, Bracknell, and David J. Collins, Crowthorne, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 25, 1982, Ser. No. 381,888
Claims priority, application United Kingdom, Jun. 9, 1981, 8117680
Int. Cl.³ A01N *41/06*; C07C *143/833*
U.S. Cl. 71—103 **17 Claims**

1. Sulphonyl urea compounds of the formula (I)

$$ArSO_2NHCONHY \qquad (I)$$

wherein Ar is a phenyl ring optionally bearing from one to five substituents each of which may be fluoro-, bromo-, or chloroalkyl of 1 to 4 carbon atoms other than trifluoromethyl; alkylsulphinyl of 1 to 4 carbon atoms; amino; mono- or dialkylamino in which the alkyl groups each have from 1 to 4 carbon atoms; carbamoyl optionally substituted by one or two methyl or ethyl groups; carboxyl and salts thereof; or alkoxycarbonyl of 2 to 5 carbon atoms, and Y is a group $-CO_2R^1$ wherein R^1 is an alkyl group of 1 to 6 carbon atoms or an alkenyl or alkynyl group of 2 to 6 carbon atoms or a phenyl group; and salts thereof.

7. A process of inhibiting the growth of plants, which comprises applying to the plants, or to the locus thereof, a phytotoxic amount of a compound of formula (I) as defined in claim 1.

4,441,918
ETHYLENE INHIBITION IN PLANTS

Bobby E. Rehberg, Winter Haven, Fla., assignor to Estech, Inc., Chicago, Ill.

Filed Jul. 1, 1982, Ser. No. 394,295
Int. Cl.³ A01N *37/118*
U.S. Cl. 71—113 **7 Claims**

1. A method of regulating plant growth by effecting ethylene inhibition which comprises treating the plant with an effective but non-injurious amount of a member selected from the group consisting of oxamide and oxamic acid and its lower alkyl esters and alkali metal salts or mixtures thereof, said amount being in the order of about 10^{-1} M to 10^{-6} M.

4,441,919
HERBICIDAL COMPOSITIONS

Konrad Albrecht, Kelkheim; Heinz Frensch, Frankfurt am Main, and Hans Schumacher, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

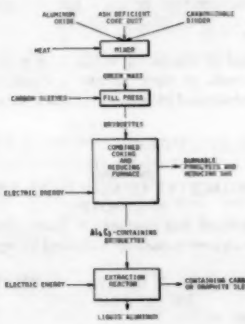
Continuation of Ser. No. 138,885, Apr. 10, 1980, abandoned.
This application Jan. 22, 1982, Ser. No. 341,751
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2914867
Int. Cl.³ A01N *37/36*
U.S. Cl. 71—120 **9 Claims**

1. A liquid herbicidal composition in the form of an emulsifiable concentrate or an aqueous suspension concentrate consisting essentially of an effective amount of Linuron as an active component in admixture with 0.05 to 2% by weight of a fat-soluble disazo dye selected from the group consisting of solvent red 23 (C.I. 26100), solvent red 24 (C.I. 26105), solvent red 27 (C.I. 26125) and solvent black 3 (C.I. 26150) wherein said disazo dye is present in an amount sufficient to inhibit the crystallization of said active component in aqueous emulsions of the emulsifiable concentrate or in aqueous suspension concentrates and the aqueous dilutions thereof.

4,441,920
METHOD FOR THE THERMAL PRODUCTION OF METALS

Siegfried Wilkening, Alfter-Oedekoven, Fed. Rep. of Germany, assignor to Vereinigte Aluminium-Werke A.G., Bonn, Fed. Rep. of Germany

Filed Nov. 28, 1980, Ser. No. 211,054
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948640
Int. Cl.³ C22B *4/04*
U.S. Cl. 75—10 R **8 Claims**



1. A method for thermally producing metals which comprises:

admixing a metal oxide and carbon;

forming said metal oxide and carbon mixture into a plurality of agglomerates, the amount of carbon in each of the agglomerates being sufficient for reducing said metal oxide to a carbide of said metal;

encasing each of said agglomerates within a shell comprising at least one material selected from the group consisting of carbon and graphite;

placing said agglomerate containing shells in a tightly packed formation;

coking said shells,

reducing the metal oxide in said agglomerates to form metal carbide by electrical resistance heating of said tightly packed shell formation, said shells remaining as a housing for said agglomerates and serving as an electrical resistance element for heating the agglomerates during said reducing reaction; and

extracting said metal from said metal carbide.

4,441,921

PRODUCTION AND TREATMENT OF FERROCHROMIUM

Thomas R. Curr, Johannesburg, and Nicholas A. Barcza, Randburg, both of South Africa, assignors to Council for Mineral Technology, Randburg and Middelburg Steel and Alloys (Proprietary) Limited, Sandown, both of, South Africa

Filed Oct. 18, 1982, Ser. No. 434,753

Claims priority, application South Africa, Oct. 19, 1982, 81/7210

Int. Cl.³ C21B *4/00*

U.S. Cl. 75—10 R **15 Claims**

1. A process for the production or treatment of ferrochromium metal comprising the steps of:

(a) feeding a feed material comprising unreduced or partly reduced chromium and iron oxides, a carbonaceous reductant, and a slagging agent to a reaction zone in a furnace bath, the slagging agent providing a slag liquidus not appreciably higher than the ferrochromium metal liquidus temperature in the furnace bath;

(b) maintaining the reaction zone in a substantially oxygen free condition;

(c) heating the reaction zone by a transferred arc thermal plasma to maintain a liquid slag phase and a molten metal phase in the reaction zone;

(d) controlling the feed rate of the feed materials to the reaction zone to maintain approximately a constant temperature in the furnace bath; and

(e) tapping the slag and ferrochromium metal.

4,441,922

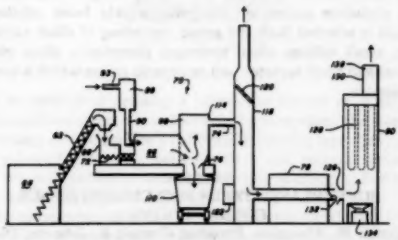
TREATMENT METHOD FOR METAL BEARING OILY WASTE

Ivan G. Most, Cape Elizabeth, and William S. Hubble, Bridgton, both of Me., assignors to Kramer Industries, Inc., Greenfield, Mass.

Filed Apr. 21, 1982, Ser. No. 370,397

Int. Cl.³ C22B *1/00*

U.S. Cl. 75—25 **16 Claims**



1. A method for treating sludge comprising a mixture of water, ferrous containing particulate, and hydrocarbon liquids, said sludge resulting from the washing in a heated detergent-and-water solution of crushed metal bathed in oil, said ferrous containing particulate comprising about 10–60% by weight of said sludge, said method comprising the steps of:

mechanically feeding the sludge into an incinerator in a controlled manner;

incinerating the hydrocarbon liquids in starved air conditions such that metallic components of the sludge are removed as a dry metallic particulate, the temperature of incineration being within the range of 1600° F. to 2350° F., and the oxygen levels of the incinerator exhaust being within the range of 4% to 6% by volume, thereby permitting the metallic particulate to be produced as a non-unitary mass; and

extracting the metallic particulate from the incinerator exhaust.

4,441,923

INTEGRATED PROCESS USING NON-STOICHIOMETRIC SULFIDES OR OXIDES OF POTASSIUM FOR MAKING LESS ACTIVE METALS AND HYDROCARBONS

Rollan Swanson, 220 California St., Santa Monica, Calif. 90403

Continuation of Ser. No. 169,281, Jul. 16, 1980, abandoned, which is a continuation-in-part of Ser. No. 706,795, Jul. 19, 1976, abandoned, and Ser. No. 3,590, Jan. 15, 1979, abandoned. This application Jan. 29, 1982, Ser. No. 343,977

Int. Cl.³ C21B *15/00*; C22B *5/02, 26/10*

U.S. Cl. 75—28 **13 Claims**

1. An integrated process for producing potassium from its non-stoichiometric oxide or sulfide and subsequently using the potassium produced to obtain less active metals and hydrocarbons, comprising the combination of steps of:

1. thermally decomposing potassium oxide or potassium sulfide substantially in the absence of water thereby obtaining potassium metal, and, respectively potassium peroxide or potassium super oxide, and potasssium disulfide; recovering said potassium metal from the aforesaid other products;

2. providing a portion of the previously obtained potassium metal at a temperature above its melting point in the molten or vapor state; reacting said potassium with at least one oxide or sulfide of magnesium, copper, calcium, silver, lead, zinc, antimony, cadmium, iron, arsenic and mixtures thereof to displace the metal from said oxide or sulfide and recovering the thus displaced less active metal from residual potassium or potassium compounds;

3. reacting another portion of the previously obtained potassium with water to form hydrogen, potassium oxide and potassium hydroxide;

4. utilizing a portion of said hydrogen obtained in Step 3 to prepare a hydrocarbon by either:

(a) reducing said hydrogen with potassium metal obtained in step 1, above, at a temperature of between 250° C. and 300° C. to form potassium hydride, next reacting said potassium hydride with carbon to form potassium acetylide, synthesizing acetylene and KOH by contacting said acetylide with water; hydrogenating said acetylene to ethene and ethane with hydrogen obtained in step 3, above, or

(b) using said hydrogen to hydrogenate carbon in the presence of a hydrogenation catalyst to form methane.

4,441,924

SOFT SOLDER MATERIAL FOR USE IN THE FORMATION OF A SOLDER BATH

Gordon F. Arbib, Hemel Hempstead, England, assignor to Multicore Solders Limited, Hemel Hempstead, England

Continuation of Ser. No. 243,735, Mar. 15, 1981. This application Jul. 8, 1983, Ser. No. 511,722

Claims priority, application United Kingdom, Mar. 17, 1980, 8008890

Int. Cl.³ B23K *35/34*

U.S. Cl. 75—65 R **24 Claims**

1. A soft solder material in the form of an extruded bar of tin/lead soft solder alloy for use in the formation of a molten soft solder bath, said material comprising:

at least one substantially uninterrupted core extending longitudinally through the interior of the extruded bar, wherein the core contains at least one organic substance in an amount sufficient to form an anti-oxidant coating on the surface of the molten bath, said substance being selected from at least one of the following classes:

(I) esters of polyhydric alcohols having a molecular weight of at least 300;

(II) ester derivatives of rosin or of a modified rosin;

(III) hydrocarbon resins derived from feedstocks of petrochemical origin; and

(IV) polymeric waxes selected from the group consisting of polyethylene glycols, polyethylene oxides, polyvinyl alcohols and polyacrylic acids.

4,441,925

METHOD AND AN APPARATUS FOR PRODUCING TITANIUM METAL FROM TITANIUM TETRACHLORIDE

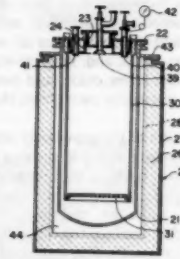
Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Mar. 19, 1982, Ser. No. 360,054

Claims priority, application Japan, Apr. 4, 1981, 56-50896; May 18, 1981, 56-74606; May 22, 1981, 56-77461

Int. Cl.³ C22B *34/12*

U.S. Cl. 75—84.5 **6 Claims**



1. In a method for producing titanium metal from titanium tetrachloride, comprising holding fused magnesium in a space which is provided in an elongated vessel means and surrounded by and heatable with a furnace means, introducing titanium tetrachloride onto said magnesium to cause a reaction therebetween so as to form a titanium metal product and a magnesium chloride byproduct, continuing such reaction until there is deposited in said vessel means a substantial volume of titanium metal, and recovering said titanium metal product and said magnesium chloride byproduct, the improvement which comprises providing a pressure-regulatable, air tight interspace, between the vessel means and the furnace means, and keeping an inert gas in said interspace at a pressure close to that inside the vessel means while the vessel means is heated in the furnace means.

4,441,926

NON-MAGNETIC ALLOY HAVING HIGH HARDNESS

Hisashi Hiraishi, Kyoto; Yoshiaki Yamakami, Toyonaka, and Atsunobu Shintani, Hirakata, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Sep. 9, 1982, Ser. No. 416,235

Claims priority, application Japan, Oct. 14, 1981, 56-163721

Int. Cl.³ C22C *38/58*

U.S. Cl. 75—128 A **2 Claims**

1. An electromagnetic stirrer roll adapted for use in continuous casting consisting essentially of a non-magnetic alloy having a magnetic permeability up to 1.004 and a Vickers hardness of at least 215, said alloy consisting essentially of the following components in the following proportions in % by weight:

C	0.1–0.6,
$0 < Si \leq 2.0$,	
Mn	5–15,
Cr	7.5–15,
Ni	5–13,
V	1.1–3, and
One of	$0 < Mo \leq 1$ and

-continued

$0 < Nb \leq 2$,

the balance being substantially Fe and inevitable impurities.

4,441,927

TANTALUM POWDER COMPOSITION

Marlyn F. Getz, Barto; Michael J. Maggio, and Billy F. Hitch, both of Boyertown, all of Pa., assignors to Cabot Corporation, Boston, Mass.

Filed Nov. 16, 1982, Ser. No. 442,027

Int. Cl.³ B22F *1/00, 3/12*

U.S. Cl. 75—229 **12 Claims**

1. An ingot-derived agglomerated tantalum powder composition comprising a granular tantalum powder having a particle size less than about 10 microns and including about 20 to 40 percent by weight of a flaked tantalum powder having a BET surface area of about 0.20 to about 0.40 m^2/gm produced by deforming a granular tantalum powder having a particle size ranging from about 10 microns to about 44 microns, said composition having an oxygen content of less than about 1900 ppm, a Scott Density greater than about 25 g/in^3, (1500 kg/m^3) a crush strength of an unsintered pellet, pressed at 6.0 g/cc, greater than about 15 pounds (67 N), and an anode capacitance, pressed at 6.0 g/cc and sintered at 1600° C., of greater than about 7500 CV/g.

4,441,928

INK COMPOSITION

Zenshiro Iijima, Higashimurayama, Japan, assignor to Adger Kogyo Co., Ltd., Japan

Continuation of Ser. No. 97,034, filed as PCT JP 79/00080, Mar. 31, 1979, publish as WO 79/00873, Nov. 1. 1979 § 102(e) date Nov. 23, 1979, abandoned. This application Oct. 7, 1982, Ser. No. 433,366

Claims priority, application Japan, Apr. 3, 1978, 53-38927

Int. Cl.³ C09D *11/00*

U.S. Cl. 106—21 **11 Claims**

1. An erasable ink composition comprising an indicator of the phthalein series; an inorganic weakly basic substance which is selected from the group consisting of alkali carbonates, alkali sulfites, alkali hydrogen phosphates, alkali phosphates and alkali acetates; and an organic amine which is triethanolamine.

4,441,929

SUPERPLASTICIZERS FOR CEMENTITIOUS COMPOSITIONS

Alphonso W. Marcellis, Boonton; Grannis S. Johnson, Plainfield, and Joseph P. Fleming, East Brunswick, all of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Aug. 24, 1982, Ser. No. 411,034

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **15 Claims**

1. A superplasticizer for cementitious compositions selected for the group consisting of:

(a) a mixture of from about 90.0 to about 96.0 parts by weight of a free acid of naphthalenesulfonic acid formaldehyde condensate and from about 4.0 to about 10.0 parts by weight of zinc sulfate; and

(b) a mixture of from about 90.0 to about 96.0 parts by weight of a salt of naphthalenesulfonic formaldehyde condensate and from about 4.0 to about 10.0 parts by weight of zinc sulfate.

4,441,930

PROCESS FOR REMOVAL OF SAND MOLD RESIDUES FROM CAST PARTS

Ulrich Baudis, Hanau; Peter Biberbach, Rodenbach, and Wolfgang Weber, Karlstein, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 16, 1980, Ser. No. 217,094
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951130
Int. Cl.³ C03C *23/00*
U.S. Cl. 134—2 13 Claims

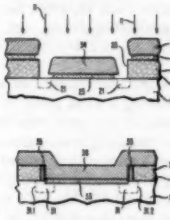
1. A process for removing and dissolving molding sand residues from cast parts in salt melts comprising inserting a cast part having molding sand residues in a melt consisting essentially of 55 to 97 weight % of alkali metal hydroxide and 3 to 45 weight % of at least one fluoride of a metallic element of the first to third main group of the periodic system of the elements and/or of zinc and also containing, based on the total weight of the above-mentioned melt, a boron containing compound which is a boron-oxygen compound or a boron-fluorine compound or a mixture thereof in an amount of from 1 to 40% by weight, and inserting the cast part in the melt at a temperature of 400° to 800° C.

4,441,931

METHOD OF MAKING SELF-ALIGNED GUARD REGIONS FOR SEMICONDUCTOR DEVICE ELEMENTS

Rafael M. Levin, Highland Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 28, 1981, Ser. No. 315,757
Int. Cl.³ H01L *21/28, 21/265*
U.S. Cl. 148—1.5 28 Claims



1. A method of defining a submicron feature on a major planar surface of a semiconductor body comprising the step of

forming on said surface a patterned insulating layer having a sidewall extending between first and second surfaces situated parallel to said major surface at differing first and second distances therefrom;

depositing nonconformally a mask-forming metal layer onto said first and second surfaces, thereby inherently defining relatively thin metal layer portions at the intersection of the sidewall with the first surface and relatively thick first and second metal layer portions overlying the first and second surfaces, respectively, at regions removed from said intersection;

etching the metal to remove the relatively thin portion completely and to leave at least some of both the first and second metal layers at the relatively thick portions, whereby a submicron gap in the remaining metal layer is formed at said sidewall; and

using the gap to define the feature;

(a) removing both said first and second metal layers simultaneously, and removing said protective layer to expose an underlying portion of the said major surface of the semiconductor body; and

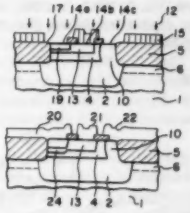
(b) forming an insulating spacer layer on the sidewall of the patterned layer.

4,441,932

PROCESS FOR PREPARING SEMICONDUCTOR DEVICE HAVING ACTIVE BASE REGION IMPLANTED THEREIN USING WALLED EMITTER OPENING AND THE EDGE OF DIELECTRIC ISOLATION ZONE

Yoichi Akasaka, and Katsuhiro Tsukamoto, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,299
Claims priority, application Japan, Mar. 11, 1981, 56-36096
Int. Cl.³ H01L *21/265, 21/225, 21/26*
U.S. Cl. 148—1.5 1 Claim



1. In a method of preparing a semiconductor device having a walled emitter structure covering at least one side surface with a dielectric layer for separation of a plurality of said devices wherein a collector is formed in a substrate by doping through the use of one of thermal diffusion and implantation of ions and wherein a surface oxide layer covering said collector and said substrate is removed with a epitaxial layer being grown on said collector and whereby said layer for separating each of a plurality of said devices is formed by selective oxidation and wherein a collector wall is formed by implantation of phosphorus ions through a first resist mask having an opening for forming said collector wall, the improved method comprising the steps of:

forming a base by implantation of ions with a second resist mask with an opening to obtain a base;

forming an emitter area by implantation of ions with a third resist mask having an emitter-opening portion and a collector-opening portion;

forming an active base just below said emitter by implantation of ions through said emitter-opening portion and an edge of said separating oxide layer through the use of a fourth resist mask which is an over-size mask.

4,441,933

METHOD OF MAKING PRODUCTS OF ALUMINIUM ALLOY SUITABLE FOR DRAWING

Francois-Regis Boutin, Virieu, and Jan Kubie, Voiron, both of France, assignors to SCAL Societe de Conditionnements en Aluminium, Paris, France

Filed Feb. 25, 1983, Ser. No. 469,757
Claims priority, application France, Apr. 30, 1982, 82 07924
Int. Cl.³ C22F *1/04*
U.S. Cl. 148—2 3 Claims

1. A method of making sheets of aluminum alloy suitable for drawing comprising the steps of:

(a) casting the alloy between cylinders to form a strip;

(b) subjecting the strip to mechanical cleaning to enable most of the particles deposited on the surface and the thick oxide layer formed during casting to be eliminated;

(c) reforming an oxide anti-galling layer on the surface of the strip by heat treatment carried out at elevated temperature in air intermittently over a period of 4 to 8 hours at a temperature in the range of 520° to 550° C. or continuously over a period of 1 to 10 minutes at a temperature in the range of 600° to 620° C.;

(d) subjecting the strip coated with the layer to the rolling operations to convert it in a sheet with a thickness of the

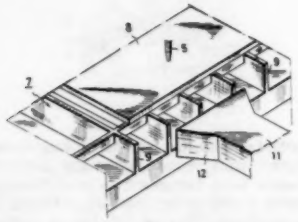
order of 300 μm in a series of passes optionally separated by annealing treatment;
(e) cutting discs from the sheet; and
(f) subjecting discs to deep drawing and ironing.

4,441,934

PROCESS AND APPARATUS FOR EXHAUSTING FUMES AND OXIDE PARTICLES GENERATED BY PLASMA-ARC CUTTING MACHINE

Masamichi Kawakami, Tokyo, Japan, assignor to Koike Sanso Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,379
Claims priority, application Japan, Dec. 14, 1981, 56-200051; Dec. 14, 1981, 56-200052
Int. Cl.³ B23K *7/00, 7/02*
U.S. Cl. 148—9 R **9 Claims**



1. In a method for exhausting fumes in a plasma cutting machine which includes a movable carriage crossing at right angles to the direction of a rail laid in parallel to the construction work of the cutting machine body running on said rail, and carries out cutting by making the upper part of the machine to be able to move the plasma cutting apparatus mounted on said carriage, said method characterized in that the lower part of a fixed board for cutting capable of supporting the material which is cut is divided relative to the direction crossing at right angles with the driving direction of said cutting machine body, and a dust collector having a hood corresponding to the plasma cutting apparatus is installed and fixed to the cutting machine body, exhausted fumes caused by the plasma cutting in every position of cutting arranged to be absorbed efficiently at the shortest distance and from the limited spaces by partitions in a lateral direction.

4,441,935

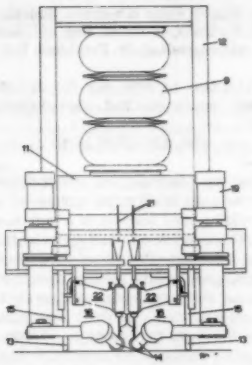
APPARATUS AND METHOD FOR SCARFING

Jan Middel, Barsingerhorn, and Gezinus A. Steenkamp, Heemskerk, both of Netherlands, assignors to Estel Hoogovens B.V., Netherlands

Filed Aug. 31, 1982, Ser. No. 413,257
Claims priority, application Netherlands, Sep. 11, 1981, 8104203
Int. Cl.³ B23K *7/06*
U.S. Cl. 148—9.5 **10 Claims**

1. In apparatus for scarfing an inspection track on a flat surface of a steel slab, particularly a slab of ductile steel of deep-drawing quality, to enable sub-surface inspection of the slab, comprising at least one burner, the improvement that:

said burner is mounted on a burner carriage having at least one skid surface by which in use the carriage contacts the said surface of the slab at an unscarfed region thereof, the apparatus further having a guide track spaced from the slab surface and driving means to move the carriage with said skid surface making sliding contact with the slab surface while the carriage is guided by said guide track, the carriage being arranged so that said skid surface makes substantial contact pressure with the slab surface so that scale on the slab surface is pushed aside and/or crushed by



the skid surface, whereby the burner is maintained at a substantially constant distance from the slab surface.

4,441,936

HIGH-STRENGTH, LOW-YIELD-POINT, COLD-ROLLED STEEL SHEET OR STRIP SUITABLE FOR DEEP DRAWING

Nobuyuki Takahashi; Masaaki Shibata, and Yoshikuni Furuno, all of Kitakyusyushi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 249,456, Mar. 31, 1981, abandoned. This application Nov. 18, 1982, Ser. No. 442,780
Claims priority, application Japan, Apr. 9, 1980, 55-46473
Int. Cl.³ C21D *8/04, 9/48*
U.S. Cl. 148—12 C **5 Claims**

1. A method for the manufacture of a high-strength cold rolled steel sheet having a yield point of not more than 26.1 kg/mm², a yield ratio of not more than 0.6, and an $\bar{r}$ value of not less than 1.6 and excelling in secondary workability, which comprises heating to a temperature of not less than 1100° C. a steel slab consisting of not more than 0.01% C, not more than 0.60% Si, not more than 1.5% Mn, 0.03 to 0.14% P, not more than 0.20sol. Al, not more than 0.008% N, Ti in an amount 4 to 20 times the combined amount of C+N and not more than 0.100%, 0.009 to 0.0080% B, with the balance being iron and unavoidable impurities, then hot rolling the heated steel slab at a finishing temperature of not less than the Ar_3 point and coiling the hot rolled steel strip at a temperature of not more than 650° C., subsequently cold rolling the resultant hot rolled steel sheet at a reduction rate of not less than 70%, and annealing the cold rolled sheet at a temperature of not more than the Ar_3 point.

4,441,937

QUENCHING BATH AND QUENCHING METHOD FOR METALS

Serge Gosset, Lestrem, and Michael Huchett, Merville, both of France, assignors to Roquette Freres, Lestrem, France

Filed Jul. 20, 1983, Ser. No. 515,466
Claims priority, application France, Jul. 23, 1982, 8212921
Int. Cl.³ C21D *1/44, 1/56*
U.S. Cl. 148—18 **8 Claims**

1. A method of quenching a metal selected from the group consisting of ferrous and non-ferrous metals and their alloys which comprises quenching said metal with an aqueous quenchant bath comprising an aqueous solution of an hydrogenated starch hydrolysate having, expressed with respect to the dry matter, a percentage of products of degree of polymerisation 1 and 2 comprised between 1 and 90, the complement to 100

being constituted by products of degree of polymerisation equal or higher than 3, the concentration of said aqueous solution in hydrolysate being from 0.2 to 80% by weight.

4,441,938

SOLDERING FLUX

Richard M. Poliak, Endwell; Dennis L. Rivenburgh, Endicott, and Carlos J. Sambucetti, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1983, Ser. No. 480,158

Int. Cl.³ B23K *35/34*

U.S. Cl. 148—23 **20 Claims**

1. A soldering flux comprising:

(A) about 40 to about 60% by weight of rosin,

(B) about 1 to about 10% by weight of at least one of compound selected from the group of ethylenediaminetetraacetic acid, sodium salt thereof, diethylenetriaminepentaacetic acid, sodium salt thereof, or mixtures thereof;

(C) about 0.1 to about 1% by weight of an ionic fluorocarbon surfactant; and

(D) the remainder being substantially at least one water soluble organic diluent.

4,441,939

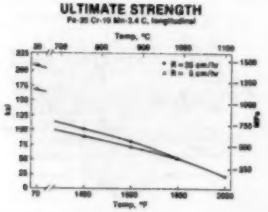
M_7C_3REINFORCED IRON BASE SUPERALLOYS

Franklin D. Lemkey, Windsor, and Earl R. Thompson, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 6, 1981, Ser. No. 318,774

Int. Cl.³ C22C *38/36, 38/38*

U.S. Cl. 148—31 **10 Claims**



1. An iron base superalloy article, of multivariant eutectic composition, which comprises an austenitic (face centered cubic) matrix reinforced by aligned carbide fibers of the M_7C_3 type, where M consists of at least 80% of a material selected from the group consisting of Cr, Fe, Mn, Ni, Co and mixtures thereof: said fibers being present in an amount of about 30% by volume, and said austenitic matrix phase being stabilized by the presence of at least about 8% Mn.

4,441,940

METHOD FOR PRODUCING TOROIDAL TAPE CORES FOR FAULT CURRENT SAFETY SWITCHES AND USE OF SUCH CORES

Friedrich Pfeifer, Bruchkoebel, and Willi Kessler, Linsengericht, both of Fed. Rep. of Germany, assignors to Vacuumschmelze GmbH, Fed. Rep. of Germany

Filed Aug. 10, 1981, Ser. No. 291,487

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031257

Int. Cl.³ H01F *1/00*

U.S. Cl. 148—121 **5 Claims**

1. A method of producing torodial tape cores for fault current safety switches with a relatively high dynamic induction boost, B_{dyn}, at least 0.08 T and, simultaneously, a relatively high temperature constancy of B_{dyn} in the temperature range of about −5° to +80° C. from a toroidal tape core wound out of a 0.05 through 0.3 mm thick tape composed of a Ni-Mo-Cu-Fe alloy such core being subject to thermal treatment in a non-oxidizing atmosphere, said method comprising of:

employing as said alloy a composition having an Ni and Cu content in a binary Ni-Cu system which is defined by an area bounded by a quadrangle of points A (80.5 wt. % Ni and 0 wt. % Cu), B (82 wt. % Ni and 0 wt. % Cu), C (70 wt. % Ni and 16.5 wt. % Cu), and D (70 wt. % Ni and 14.4 wt. % Cu), and having a Mo content, z, in wt. % which satisfies the relation:

$$11/30(x-68) \leqq z \leqq 11/30(x-63.5)$$

with a given Ni content, x, in wt. %. and the remainder consisting essentially of Fe along with minor amounts of impurities and usual processing-promiting and deoxidizing additives;

said thermal treatments in said non-oxidizing atmosphere consisting of annealing said core for at least about 30 minutes at a temperature ranging between 900° and 1200° C., and

thereafter tempering said so annealed tape core in accordance with its Mo content at a temperature ranging between 450° and 550° C. in such a manner that the magnetic anisotropy K_1, thereof becomes equal to 0 at a temperature between −5° and +30° C.

5. A toroidal tape core for an electronic safety switch, and for fault current-sensitive safety switches, with a relatively high dynamic induction boost, B_{dyn}, at least 0.08 T and, simultaneously, a relatively high temperature constancy of B_{dyn} in the temperature range of about −5° to +80° C.; said core having been wound out of a 0.05 through 0.3 mm thick tape composed of Ni-Mo-Cu-Fe alloy, such core having been subjected to thermal treatment in a non-oxidizing atmosphere,

said alloy having a Ni and Cu content in a binary Ni-Cu system which is defined by an area bounded by a quadrangle of points A (80.5 wt. % Ni and 0 wt. % Cu), B (82 wt. % Ni and 0 wt. % Cu), C (70 wt. % Ni and 16.5 wt. % Cu), and D (70 wt. % Ni and 14.4 wt. % Cu), and having a Mo content, z, in wt. % which satisfies the relation:

$$11/30(x-68) \leqq z \leqq 11/30(x-63.5)$$

with a given Ni content, x, in wt. %, and the remainder consisting essentially of Fe along with minor amounts of impurities and usual processing-promoting and deoxidizing additives;

said thermal treatment in said non-oxidizing atmosphere consisting of first annealing said core for at least about 30 minutes at a temperature ranging between 900° and 1200° C., and

thereafter tempering said so annealed tape core in accordance with its Mo content at a temperature ranging between 450° and 550° C. in such a manner that the magnetic anisotropy K_1, thereof becomes equal to 0 at a temperature between −5° and +30° C.

4,441,941

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE EMPLOYING ELEMENT ISOLATION USING INSULATING MATERIALS

Hiroshi Nozawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 4, 1981, Ser. No. 240,300

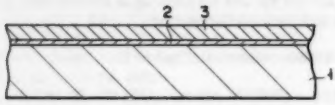
Claims priority, application Japan, Mar. 6, 1980, 55-27310; Mar. 6, 1980, 55-27311; Mar. 12, 1980, 55-30307; Jul. 10, 1980, 55-93254

Int. Cl.³ H01L *21/22*

U.S. Cl. 148—187 **10 Claims**

1. A method for manufacturing a semiconductor device employing element isolation of an active region in a semiconductor substrate by forming insulating materials, said method comprising the steps of:

a. forming an oxidizable material layer on a surface of the semiconductor substrate;
b. forming an oxidation mask on a portion of said oxidizable material layer overlying said active region;
c. oxidizing at least part of said oxidizable material layer not covered with said oxidation mask forming an oxide layer for element isolation;



d. removing said oxidation mask;
e. partially exposing the surface of said semiconductor substrate by removing at least a part of said oxidizable material layer exposed by said step of removing said oxidation mask; and
f. forming a semiconductor element in said exposed surface of said semiconductor substrate.

4,441,942

EMBEDMENT SYSTEM FOR ULTRAHIGH-BURNING RATE PROPELLANTS OF SOLID PROPULSION SUBSYSTEMS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1983, Ser. No. 455,366
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.6 **1 Claim**

1. An embedment system for use with a composite-modified double-base propellant composition, said embedment system comprised of an embedment granule portion (A) which comprises ingredients (i–vi) in percent by weight as follows:
(A) embedment granule portion:
(i) nitrocellulose: 23.0;
(ii) nitroglycerine: 15.0;
(iii) resorcinol: 1.5;
(iv) 2-nitrodiphenylamine: 1.0;
(v) ammonium perchlorate (10 micrometers weight-mean-diameter particle size): 45.5; and,
(vi) aluminum powder (20 micrometers weight-mean-diameter particle size): 14.0; and,
an embedment resin portion (B) which comprises ingredients (i–iii) in percent by weight as follows:
(B) embedment resin portion:
(i) bisphenol A epichlorohydrin: 44.0;
(ii) epoxidized dimer acid: 20.0; and,
(iii) condensation product of 2 moles of 1,2-bis(-maleimido)ethane with one mole of triaminotriazine: 36.0,
said condensation product prepared by reacting said 1,2-bis(-maleimido)ethane and said triaminotriazine at 80°–100° C. to yield a low molecular weight reaction prepolymer for curing said bisphenol A-epichlorohydrin and said epoxidized dimer acid.

4,441,943

POLYPEPTIDES AS CHEMICAL TAGGING MATERIALS

Paul H. Kydd, Lawrenceville, N.J., assignor to HRI Inc., Gibbsboro, N.J.

Division of Ser. No. 264,991, May 18, 1981, Pat. No. 4,359,353. This application Sep. 13, 1982, Ser. No. 417,811
Int. Cl.³ D03D *23/00*; E02B *15/00*
U.S. Cl. 149—109.4 **3 Claims**

1. A method of tagging a substance which is comprised of an explosive composition or an oil to allow subsequent identification thereof comprising incorporating in said substance a synthetic polypeptide having a specific sequence of amino acids.

4,441,944

BUILDING BOARD COMPOSITION AND METHOD OF MAKING SAME

David H. Massey, Winnetka, Ill., assignor to PMP Corporation, Mundelein, Ill.

Filed Dec. 31, 1981, Ser. No. 336,498
Int. Cl.³ F04B *2/00*; B05D *3/02*
U.S. Cl. 156—71 **7 Claims**

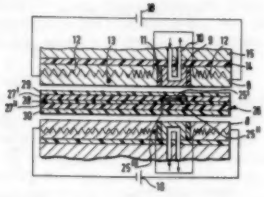
1. A method of forming an insulative construction monolith which comprises the following:
(a) forming a liquid aqueous base cementitious slurry containing from 10 to 70 parts by volume of portland cement, 10 to 70 parts by volume of polymeric emulsion and 10 to 70 parts by volume of flyash containing from 5 to about 100 percent by volume of cenospheres;
(b) applying a coating layer of said liquid slurry to at least one surface of a cellular insulating board monolith to form a composite; and
(c) drying and curing said composite.

4,441,945

METHOD FOR SELECTIVE LAMINATION OF THERMOPLASTIC LAYERS

Roland Moraw, and Renate Schädlich, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 10, 1980, Ser. No. 111,033
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 2900978
Int. Cl.³ B60J *1/00*; B32B *31/00*
U.S. Cl. 156—108 **4 Claims**



1. A process for the selective lamination by means of heat and pressure of at least internal surfaces of two thermoplastic layers, at least one of said layers including therein at least one window portion in which at least one insert is located, said lamination ocurring without laminating at least one window portion of said layers, said process comprising the steps of:
aligning said at least two thermoplastic layers along said window portions;
discontinuously pressing said at least two thermoplastic layers together, said discontinuous pressing occurring at the window portions of said layers and the pressure thereon being less than the pressure applied to the rest of the surface of said layers; and
heating the external surfaces of said thermoplastic layers in a discontinuous manner across each of said external surfaces, said discontinuous heating occurring at each of said selected window portions of said layers with said temperature at said window portion being at least 10° C. lower than at the rest of the external surfaces of said layers, wherein said discontinuous heating step includes the steps of:
heating an area immediately adjacent said selected window portion to a temperature higher than the temperature of the rest of the surfaces of said layers; and
cooling said selected window portion to a temperature which is from 10° to 70° C. below the rest of the external surfaces of said layers.

4,441,946

HEAT AND HUMIDITY RESISTANT STEEL CORD REINFORCED RUBBER COMPOSITE

Satish C. Sharma, Mogadore, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 260,234, May 4, 1981, abandoned. This application Nov. 22, 1982, Ser. No. 443,253

Int. Cl.³ B29M *5/02*

U.S. Cl. 156—307.3 3 Claims

1. A method of bonding bright steel cord to an unvulcanized vulcanizable rubber which comprises coating said cord, said cord being free of acid or base surface treatment prior to coating, with an amino functional organo silane wherein said vulcanizable rubber contains a resorcinol and hexamethyol melamine bonding agent, a hydrated silica and other conventional rubber compounding ingredients, combining said coated bright steel cord and said unvulcanized vulcanizable rubber to form a composite and vulcanizing said composite.

4,441,947

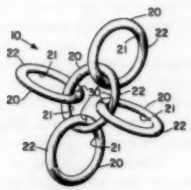
ARTICULATED FABRIC FORMED BY SELF-ASSEMBLING FIBERS

Edward F. Leonard, Bronxville, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 367,203, Apr. 12, 1982, Pat. No. 4,421,818. This application Sep. 19, 1983, Ser. No. 533,172

Int. Cl.³ B32B *31/00*; D04H *3/16*

U.S. Cl. 156—158 11 Claims



1. A method for producing a patterned, nonwoven, articulated fabric exhibiting a substantially uniform texture and comprised of a multiplicity of synthetic fiber elements, the opposing free ends of each of said synthetic fiber elements being joined to one another to form substantially continuous loops, said loops being interconnected to one another in a predetermined pattern, said method comprising the steps of:

(a) preparing a multiplicity of substantially straight synthetic fiber elements of predetermined length, each of said elements exhibiting a non-uniform shrinkage potential along its cross-section, as measured in a direction substantially perpendicular to its length;

(b) orienting said substantially straight synthetic fiber elements so that said non-uniform shrinkage potential along their cross-sections will cause them to simultaneously curl in a predetermined orientation and interlock with one another when said fibers are subjected to a predetermined external stimulus;

(c) subjecting said synthetic fiber elements to said predetermined external stimulus, thereby causing said fibers to curl in a predetermined orientation and interlock with one another; and

(d) joining the opposing free ends of each of said fiber elements to one another to form substantially continuous loops which are interconnected with one another in a predetermined pattern.

4,441,948

METHOD AND APPARATUS FOR CONSTRUCTING MULTIPLE LAYER CORRUGATED BOARD CONTAINERS

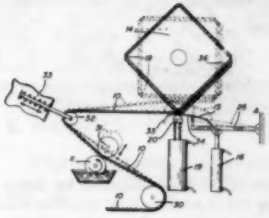
David F. Gillard, Surrey, and Jack T. Yelf, West Vancouver, both of Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada

Filed Jul. 14, 1982, Ser. No. 397,990

Claims priority, application United Kingdom, Oct. 28, 1981, 8132505

Int. Cl.³ B31F *1/22*

U.S. Cl. 156—189 13 Claims



1. In a method of forming a multi-layered container having a plurality of substantially flat sides with corners between adjacent sides, wherein compressible sheet layers are wound on a forming mandrel, the improvement comprising the steps of:

attaching one edge of a compressible sheet layer adjacent a corner of the mandrel,

pressing a pressure shoe plate across the width of the layer against the mandrel,

rotating the mandrel to wind the layer on the mandrel ensuring that the plate has sufficient movement to be in contact with the layer on the mandrel as it rotates to keep a substantially constant pressure on the mandrel, said substantially constant pressure being insufficient to compress the layer, and applying an additional momentary force to the shoe plate as each corner of the mandrel passes over the shoe plate such that the layer at each corner is compressed.

6. An apparatus for forming a multi-layered container of corrugated board having a plurality of substantially flat sides with corners between adjacent sides comprising:

a forming mandrel having a plurality of substantially flat sides with corners between adjacent sides, the mandrel having means to grip an edge of a corrugated board layer,

rotating means to rotate the mandrel and wind the layer around the mandrel,

pressure shoe plate located across the width of the mandrel and having movement in a predetermined path,

pressure means to push the plate in the predetermined path against the mandrel at a substantially constant pressure so that the layer is squeezed between the plate and the mandrel during rotation of the mandrel, said substantially constant pressure being insufficient to compress the layer, and momentary high pressure means to provide an additional force on the plate to compress the layer at each corner of the mandrel.

4,441,949

PROCESS FOR LINING MOULDED ARTICLES AND APPARATUS FOR PERFORMING THE PROCESS

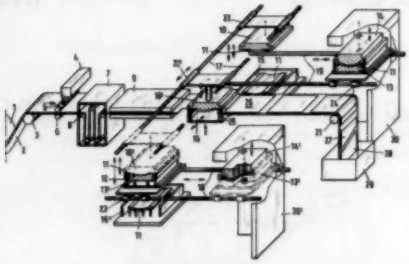
Günter H. Kiss, Gustav-Freytag-Strasse 7, D-1000 Berlin 33, Fed. Rep. of Germany

Filed Aug. 18, 1982, Ser. No. 409,076

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3138442

Int. Cl.³ B65C *9/08*

U.S. Cl. 156—212 **12 Claims**



1. In a process of the class described for lining moulded blanks on a lining foil to produce lined moulded articles, comprising the steps of supplying the moulded blanks to blank support means, supplying the lining foil on a continuous belt passing through lining apparatus, applying and durably securing the lining foil onto the moulded blanks by action of heat and pressure, and finishing the lined moulded blanks in finishing means to yield finished lined moulded articles;

the improvement wherein said lining apparatus include at least two lining mould devices alternately disposed to respective sides of said continuous belt, and said finishing means include a respective at least two finishing mould assemblies alternately disposed to respective sides of said continuous belt, at least a portion of each of said finishing mould assemblies being displaceable to receive, at one end portion thereof, the lined moulded blank from the associated one of said lining mould devices and to another end position thereof corresponding to an operative portion of the respective finishing mould assembly;

and further comprising the steps of alternately suppling said blanks to said lining apparatus from respective sides of said continuous belt in time sequence; and whereby, while one of said lining mould devices is engaging a moulded blank supported by the blank support means on one of the respective sides of the continuous belt, another lining mould device is securing another moulded blank to the lining foil.

4,441,950

UNIVERSAL FILE WITH INNER GLUING BACK FOR THERMAL GLUING SYSTEMS

Carla P. Lolli, Gansbroekstraat 24, Puurs, Belgium (2658)

Continuation of Ser. No. 66,394, Aug. 14, 1979, abandoned. This application Apr. 27, 1983, Ser. No. 487,241

Claims priority, application Belgium, Aug. 22, 1978, 2/57218; Sep. 1, 1978, 2/57251

Int. Cl.³ B32B *3/04*

U.S. Cl. 156—216 **9 Claims**

1. A method of binding bundles of documents having varying thicknesses comprising:

(a) providing a universal file comprising a single-layer front cover sheet having a rear edge and inner and outer surfaces, a single-layer rear cover sheet having a rear edge and inner and outer surfaces, a back sheet of flexible material fastened to the outer surface adjacent the rear edge of each of said cover sheets and a strip of glue having a predetermined width disposed on said back sheet between the inner surfaces of said cover sheets;

(b) inserting a bundle of document sheets between said cover sheets; said bundle of document sheets having a thickness less than the width of said glue strip;

(c) wrapping said backing around the edge of said bundle with one edge of each of said document sheets abutting against said back sheet and said glue;

(d) introducing said file with said bundle of document sheets therein into a heating machine and heating said glue to bond said document sheets to said backing and said front and rear cover sheets and form a bound set of documents, the finished binding for which is formed of only a pair of cover sheets and a back; and

(e) cooling the bound documents.

4,441,951

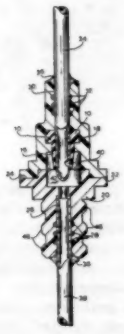
MULTIPLE SAMPLING DEVICE HAVING MOLDED VALVE AND HUB

Werner Christinger, Franklin Lakes, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Division of Ser. No. 66,818, Aug. 15, 1979, Pat. No. 4,295,477. This application Jul. 14, 1981, Ser. No. 282,998

Int. Cl.³ B29C *19/00*; A61B *5/14*

U.S. Cl. 156—245 **2 Claims**



1. A method for manufacturing a multipled blood sampling device adapted to be coupled with an evacuated container to obtain blood samples from a patient, comprising the steps of:

molding a one-way valve into a desired form including a first portion and a second portion;

molding a first housing part around the first portion of said valve so as to securely attach it thereto,

molding a second housing part having a chamber around said second portion of said one-way valve so that said second portion freely extends into said chamber;

attaching a first cannula to said first housing part;

attaching a second cannula to said second housing part,

joining said first and second housing parts together permanently, and

the valve, housing parts, and cannulas being assembled in such a manner that blood is able to flow through the first cannula, the one-way valve and chamber in said housing

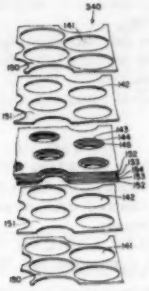
parts, and into the second cannula when suction is applied at said second cannula, the valve arranged to prevent any backflow from said second cannula to said first cannula.

4,441,952

METHOD AND APPARATUS FOR UNIFORMLY DEBOSSING AND APERTURING A RESILIENT PLASTIC WEB

William I. Mullane, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 2, 1981, Ser. No. 230,488
Int. Cl.³ A61F *13/16*; B31F *1/00*; B32F *31/00*
U.S. Cl. 156—222 **12 Claims**



1. A method for constructing a forming cylinder for imparting an uninterrupted, uniformly apertured three-dimensional pattern to a heated plastic film subjected to a fluid pressure differential while in contact with its surface, said method comprising the steps of:

(a) forming substantially continuous patterns of apertures in a multiplicity of planar sheets, at least a portion of said sheets having aperture patterns in which the apertures at least to a degree coincide from one sheet to another, at least a portion of said coinciding apertures being dissimilar in size from one lamina to another;

(b) superposing said sheets having said patterns of coinciding, dissimilarly sized apertures upon one another to form a three-dimensional stack having a greater overall thickness than the maximum depth to which said film is drawn when subjected to said fluid pressure differential, said stack further exhibiting a three-dimensional continuum of capillary networks, each of said capillary networks placing the uppermost and lowermost surfaces of said stack in exclusive fluid communication with one another, each of said capillary networks having a cross-sectional area which varies in size intermediate the uppermost and lowermost surfaces of said stack, said cross-sectional area reaching a minimum at a point located intermediate said uppermost and lowermost surfaces of said stack and thereafter increasing in the direction of the lowermost surface of said stack;

(c) bonding said superposed stack of sheets to one another at contact points to form an integral laminate structure;

(d) causing the uppermost surface of said laminate structure to assume a radius of curvature greater than that of said lowermost surface of said laminate structure without causing delamination thereof, thereby causing said laminate structure to assume a substantially tubular shape having an outermost surface corresponding to the uppermost surface of said stack and an innermost surface corresponding to the lowermost surface of said stack;

(e) securing the opposing free edges of said tubular shaped laminate structure to one another while maintaining substantial continuity of said three-dimensional continuum of capillary networks about the entire periphery of the tubular member thus formed; and

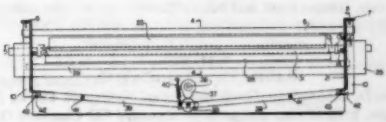
(f) supporting the innermost surface of said tubular laminate structure on a multiplicity of support members, each of said support members having a land which contacts the innermost surface of said tubular laminate structure, the width of said lands being insufficient to completely obstruct said capillary networks at their points of contact with the innermost surface of said tubular laminate structure, whereby said outermost and said innermost surfaces of said tubular laminate structure are maintained in fluid communication with one another about the periphery of said tubular structure.

4,441,953

HEAT SEALING MACHINE AND PROCESS FOR HEAT SEALING PLASTIC FILM EDGES

William K. Hollinger, Jr., 7015 Duncraig Ct., McLean, Va. 22101

Filed Mar. 15, 1982, Ser. No. 358,032
Int. Cl.³ B32B *31/20*
U.S. Cl. 156—290 **34 Claims**



1. A heat sealing machine for simultaneously heat sealing at least two sets of plastic films or sheets, said machine comprising a work surface means for supporting said plastic sheets, an elongated heat sealing means for simultaneously heat sealing at least one set of superposed plastic films or sheets on each side thereof and projecting, at least during the heat sealing step, at least in part above said work surface means with said work surface means extending on either side of said heat sealing means, movable alignment means for providing an alignment guide for the sets of plastic sheets to be heat sealed, and movable clamping means for clamping an aligned set of said plastic sheets to said work wurface means in position on either side of said heat sealing means to be heat sealed by said heat sealing means, said clamping means and said alignment means cooperating so that at least during a portion of the time that the clamping means clamps said sets of plastic sheets, the alignment means is out of alignment relationship to the clamped plastic sheets, and at least during a portion of the time that said alignment means is in position to align each set of plastic sheets, the clamping means is out of clamping engagement with said plastic sheets.

9. A method of simultaneously heat sealing at least two sets of plastic films or sheets, said method comprising aligning each set of said films or sheets in proper positions on a heat-sealing machine by contacting the edge of each set of the films or sheets with a movable alignment means with at least one set of films or sheets on each side of the alignment means, clamping said aligned sets of plastic film or sheet and moving the alignment means out of aligning position, exposing the aligned edges of the plastic film or sheet to heat from an elongated heating element positioned between at least two sets of the aligned plastic sheets for a predetermined time to weld or seal the plastic films or sheets edges, thereafter terminating transfer of heat from the heating element to the edges and disengaging the plastic film or sheet from clamping engagement.

4,441,954

PHENOL-ALDEHYDE BENTONITE ADHESIVE COMPOSITION IN WOOD LAMINATION PROCESS

Seymour Hartman, Mahopac, and Timothy M. Brown, Holmes, both of N.Y., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 177,471, Aug. 12, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 430,186

Int. Cl.³ C09J *1/00*

U.S. Cl. 156—291 10 Claims

1. A process for making wood laminates from a plurality of wood plies which comprises:

(a) applying an adhesive to mating surfaces of a plurality of wood plies in an amount of from 70 to 90 pounds per thousand square feet of double glue line, the adhesive consisting essentially of a condensation product of a phenol and an aldehyde having a molar ratio of phenol to aldehyde in the range of 1:1.5 to 1:2.5, an alkaline catalyst selected from the group consisting of alkali metal and alkaline earth metal hydroxides, from 20% to 35% of bentonite clay based on the weight of condensation product solids;

(b) assembling a panel of the plurality of wood plies by mating the surfaces to which the adhesive has been applied;

(c) pressing the assembled plies under pressure for a time effective to create a bond of sufficient strength between them to hold them together in a unitary, consolidated panel; and

(d) pressing the consolidated panel under conditions of pressure, temperature and time effective to cure the adhesive.

4,441,955

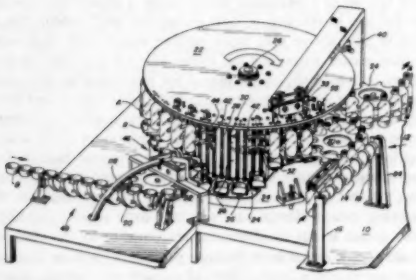
BASE CUP APPLICATOR

Bryan D. Richardson, Good Hope, and Shelton E. Lewis, Norcross, both of Ga., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 5, 1982, Ser. No. 405,554

Int. Cl.³ B29D *3/00*

U.S. Cl. 156—423 2 Claims



1. Apparatus for applying base cups to the bottoms of rounded bottom containers comprising:

(1) upper and lower circular driven support plates,

(2) U-shaped bottle holders mounted below said upper support plate,

(3) a plurality of internal gripper assemblies including an upwardly biased internal gripper mounted on said upper support plate,

(4) vertical support means extending between said support plates,

(5) a first cam surrounding said lower support plate,

(6) vertically movable shoes mounted on said support means adapted to be driven vertically by said cam,

(7) bottle supply means adapted to supply bottles to said machine at a first position,

(8) a second cam mounted above said upper circular support plate at a location downstream of said first position adapted to depress an internal gripper into the neck of a container,

(9) a first portion of said first cam aligned with said second cam adapted to raise a shoe thereby pushing a container upwardly onto a depressed internal gripper at a second location,

(10) a second portion of said first cam being adapted to permit movement of said shoes to a lowermost position,

(11) means to supply base cups to said shoes in said lowermost position,

(12) means to apply an adhesive to the bottoms of said containers at a third position,

(13) a third portion of said first cam downstream of said third position adapted to raise said shoes to a position where a base cup is pressed onto the bottom of a container in a fourth position,

(14) a third cam mounted above said upper transport member adapted to release a bottle from an internal gripper at a fifth position, and

(15) bottle removal means at a sixth position.

4,441,956

APPARATUS FOR TUCKING THE EDGE ZONE OF A SURFACE COVERING OVER A SUPPORTING EDGE

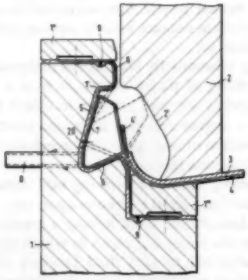
Günter H. Kiss, Gustav-Freytag-Strasse 7, D-1000 Berlin 33, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,272

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3127203

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—479 16 Claims



1. Apparatus for tucking the edge zone of a surface covering over a supporting edge, the apparatus comprising, in combination:

a pair of support members which respectively include contact surfaces in spaced relationship with each other to define an enlarged opening therebetween;

means for maintaining a surface covering and a supporting edge between the support members with the edge zone of the surface covering overlapping said edge and extending into the enlarged opening, the edge including at least one corner portion;

a flexible impermeable turn-over membrane disposed within the enlarged opening in position to move toward and away from the edge zone;

a deformable fold-over member located within the opening between the turn-over membrane and the edge zone, the fold-over member being formed as a shaped tube and being filled with resilient foam at the locations of said at least one corner portion of the surface covering; and

means for applying pressure to the turn-over membrane to move the membrane and the associated fold-over member toward the edge zone and thereby urge said edge zone over its supporting edge, the filling of resilient foam serv-

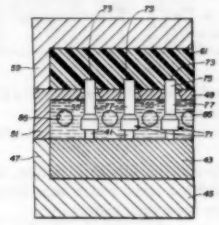
ing to prevent the shaped tube of the fold-over member from kinking at the locations of the at least one corner portion.

4,441,957

METHOD FOR SELECTIVELY ETCHING INTEGRAL CATHODE SUBSTRATE AND SUPPORT

Wayne R. Poff, Lancaster, and Donald W. Bartch, Wrightsville, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1980, Ser. No. 210,246
Int. Cl.³ C23F *1/02*; H01L *21/312*
U.S. Cl. 156—656 **9 Claims**



1. In a method for preparing an integral cathode substrate and support including

(a) providing a formed metallic part, said part including a cathode substrate and an integral support therefore,

(b) masking selected portions of the surface of said part with an etch-resistant mask,

(c) etching the unmasked portions of said surface to a desired depth

(d) and then removing said mask, the improvement wherein said masking step is conducted by providing a chamber around said part and pressing surface portions of an etch-resistant, compressible sheet against said selected surface portions of said part, said sheet constituting one wall of said chamber, and wherein said etching step is conducted by passing a liquid etchant through said chamber into contact with said unmasked surface portions of said part.

4,441,958

FORCED-CIRCULATION EVAPORATOR PLANT

Giampaolo Teucci, Villa Emilia, Ortignano Reggiolo, Italy

Filed Jan. 15, 1982, Ser. No. 339,676
Claims priority, application Italy, Jan. 27, 1981, 19340 A/81
Int. Cl.³ B01D *1/04, 1/20, 1/26*
U.S. Cl. 159—2 MS **5 Claims**

1. A forced circulation evaporator plant for processing a product to be concentrated, comprising:

product storage means,

means for supplying a product to be concentrated to said product storage means,

a circulating pump connected to said product storage means,

a plurality of heat exchangers connected in series with one another and to said circulating pump,

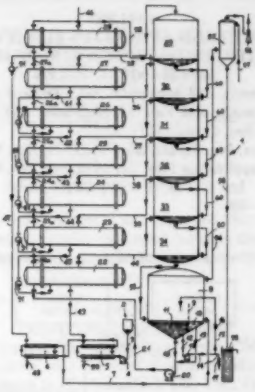
a plurality of flash drums connected in series with one another and to said product storage means,

each of said flash drums being also connected to a different one of said heat exchangers, thereby respectively supplying heating vapors thereto,

product storage means having at least two compartments, a first of said compartments storing said product before concentration and a second of said compartments storing said product after concentration,

means for withdrawing said product from said first and second compartments in predetermined proportions to form a mixed product,

said mixed product circulating through said heat exchangers and flash drums in series, becoming progressively more concentrated, and returning as concentrated product to said second compartment,



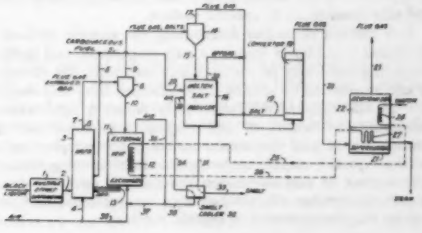
and means for withdrawing said concentrated product from said second compartment for use.

4,441,959

RECOVERY OF HEAT AND CHEMICAL VALUES FROM SPENT PULPING LIQUORS

Howard L. Empie, Jr., Goshen, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,492
Int. Cl.³ D21C *11/12*
U.S. Cl. 162—30.1 **9 Claims**



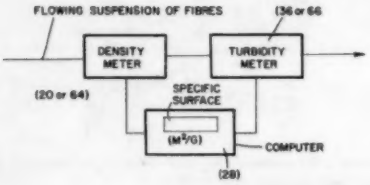
1. An integrated process for the recovery of energy and chemical values from spent pulping liquors comprising an initial stage of subjecting concentrated spent pulping liquor to combustion with air in a fluidized bed reaction chamber provided with a plurality of inert solid particulate materials, at least one of which is of finer particle size than another, followed by at least one further step of treating the finer particle size inert particulate material in an external fluidized bed to recover heat values wherein at least a portion of said inert finer particle size solid particulate material is separated from the gaseous and solid combustion products produced by said combustion with air and passed to said external fluidized bed and then passed back to said fluidized bed reaction chamber; wherein said solid combustion products and said gaseous combustion products obtained from said separation are then also separated and the separated solid combustion products are passed to a molten salt reducer for recovery of smelt leaving a minor portion of said solid combustion products entrained in said gaseous combustion products; and thereafter said separated gaseous combustion products containing said remaining entrained solid combustion products are further oxidized at a

temperature greater than the melting point of said solid combustion products and molten salts are recovered from said further oxidation and fed back to the reducer.

4,441,960
METHOD AND APPARATUS FOR ON-LINE MONITORING OF SPECIFIC SURFACE OF MECHANICAL PULPS

Alkibiadis Karnis, 487 Montcalm Ave., Dollard des Ormeaux, Quebec, Canada, and Paul M. Shallhorn, 159 Bastien, Vaudreuil, Quebec, Canada (J7V 5Y7)

Division of Ser. No. 38,631, May 16, 1979, Pat. No. 4,276,119. This application Nov. 26, 1979, Ser. No. 97,109
Int. Cl.³ D21F 7/06; G01N 21/00
U.S. Cl. 162—49 **4 Claims**



1. An apparatus for on-line determining the specific surface of fibrillated wood fibres forming a pulp suspension, said apparatus consisting essentially of means to continuously measure the turbidity of said suspension by sensing light reflected from said suspension as said suspension continuously passes a light source, means for measuring directly density of said suspension to determine the consistency of said suspension substantially independent of other properties of said pulp suspension and means for determining said specific surface of said fibres based on a predetermined relationship of said turbidity measurement and said consistency to specific surface.

3. A method of on-line determining the specific surface of fibrillated wood fibres forming a pulp suspension, said method consisting essentially of: continuously measuring the turbidity of said suspension by sensing light reflected from said suspension as said suspension continuously passes a light source, measuring the density of said suspension to determine the consistency of said suspension substantially independent of other properties of pulp suspension and determining the specific surface of said suspension fibres based on a pre-determined relationship of said turbidity measurement and said consistency measurement to specific surface.

4,441,961
PULP INSULATED TELECOMMUNICATIONS CONDUCTOR

John F. Porter, St. Catharines; Joerg-Heim J. Walling, Beaconsfield, and Oleg Axiuk, Pincourt, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

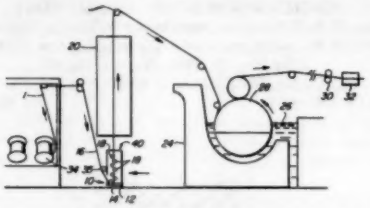
Filed Sep. 27, 1982, Ser. No. 424,086
Int. Cl.³ D21D 3/00
U.S. Cl. 162—106 **9 Claims**

1. A method of making pulp insulated telecommunications conductor comprising:

passing the conductor around a first roll while immersed in a bath of acrylic resin solution to provide the conductor with a covering layer of solution;

passing the conductor along its feedpath at a controlled speed and successively into contact with wiping rolls of a series of wiping rolls which are staggered alon sides of the path of the conductor while rotating the rolls to provide a differential speed between the rolls and the conductor to create a wiping action, the speed of rotation of the rolls and their distance apart being controlled to determine both the angle of contact with the conductor and the differential speed of the conductor and the peripheral surface of the rolls to provide, after the further steps in the method, a dried thickness of resin of no greater than 0.00015 inches;

passing the coated conductor through a solution drying oven to dry the coating to make it resistant to migration



from the conductor while immersed in a pulp bath downstream of the oven;

coating the adhesive coated conductor with pulp in a pulp bath; and

drying the pulp and the adhesive coating, the coating producing a solidified layer which adhesively retains fibers from the pulp upon the conductor.

4,441,962
SOFT, ABSORBENT TISSUE PAPER

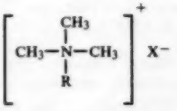
Thomas W. Osborn, III, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 197,291, Oct. 15, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,700
Int. Cl.³ D21H 3/12, 5/24
U.S. Cl. 162—111 **18 Claims**

1. A process for making a soft, absorbent tissue paper web comprising the steps of forming an aqueous papermaking furnish, depositing said furnish on a foraminous surface, removing the water from said furnish, and enhancing the strength of the web so formed wherein said aqueous papermaking furnish comprises:

(a) papermaking fibers;

(b) at least one quaternary ammonium compound having the structure



wherein R is an aliphatic hydrocarbon radical selected from the group consisting of alkyl radicals having from about 12 to about 18 carbon atoms, alkylene radicals having from about 12 to about 18 carbon atoms, coconut, and tallow, and X is halogen;

(c) at least one nonionic surfactant selected from the group consisting of

(1) ethylene oxide adducts of fatty alcohols; and

(2) ethylene oxide adducts of fatty acids

wherein said fatty alcohols and fatty acids each have from about 12 to about 18 carbon atoms and wherein said adducts contain from about 2 to about 12 moles of ethylene oxide;

wherein said quaternary ammonium compound is present at from about 0.5 to about 5.0 grams per kilogram of paper making fiber and said nonionic surfactant is present at from about 0.5 to about 5.0 grams per kilogram of papermaking fiber.

4,441,963

DISTILLATION APPARATUS

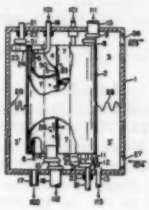
Yao T. Li, Huckleberry Hill, Lincoln, Mass. 01773

Continuation of Ser. No. 201,380, Oct. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 961,452, Nov. 16, 1978, Pat. No. 4,230,529. This application Apr. 7, 1982, Ser. No. 367,251

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.³ B01D *1/22, 1/26, 1/28*

U.S. Cl. 202—172 31 Claims



1. Distillation apparatus comprising

an even number of pairs of vertically aligned heat transfer tube groups,

means for mounting each of said pairs of tube groups symmetrically aligned about an associated vertical axis and with two of said pairs of tube groups arranged with a mutual angular displacement that has a criss-cross configuration in a plane transverse to said associated vertical axes, said mounting means including means for restraining said tube groups from rotation about said vertical axis while allowing them to wobble,

means to drive said mounting means and said pairs of heat transfer tube groups about wobbling centers each associated with one of said pairs of tube groups and located along said associated vertical axis, said drive means including a common drive shaft and a plurality of eccentric drive systems each connected between said drive shaft and an associated one of said pairs of tube groups, said drive means and said mounting means providing a dynamic self balancing of said tube groups during said wobbling, and

means to direct a stream of fluid toward the inner surface of each of said transfer tubes, the wobbling motion imparted to each of said transfer tubes serving to cause said fluid stream to cling to the inner surface of the transfer tube away from the wobbling center whereby the resulting revolving flow stream serves to wipe the inside surface of the transfer tube to form a thin film with low heat resistance and thus to facilitate evaporation and carry the residue and reflux downward with low resistance.

4,441,964

METHOD OF DEPOSITING A METAL

Franciscus E. P. Mikkers, and Peter E. Wierenga, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

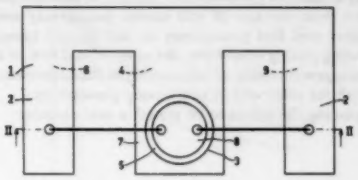
Filed Jan. 21, 1983, Ser. No. 459,859

Claims priority, application Netherlands, Feb. 15, 1982, 8200561

Int. Cl.³ C25D *5/02*

U.S. Cl. 204—15 6 Claims

1. A method of depositing a metal on a heat-conducting metallic substrate, in which a surface of the substrate is irradiated at at least one area by a laser beam, while said metallic substrate is in a metal deposition bath and the metal is deposited from the bath on said irradiated surface on the substrate, characterized in that the metal is deposited on a layer of the substrate which is located at the irradiated area and in its non-irradiated surroundings and has a thermal conductivity which is smaller than the thermal conductivity of the metal of the substrate adjoining the layer, the ratio between the thermal



conductivity of the material of said layer and that of the adjoining substrate being smaller than ratio between the thickness of said layer and the diameter of said laser beam.

4,441,965

CODEPOSITION METHOD

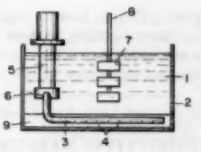
Sowjun Matsumura, Toyonaka; Ken Araki, Ibaragi; Tetsuo Otaka, Kashiwa, and Masumi Tanigawa, Hirakata, all of Japan, assignors to C. Uyemura & Co., Ltd., Osaka, Japan

Filed May 20, 1983, Ser. No. 496,396

Claims priority, application Japan, May 21, 1982, 57-87076

Int. Cl.³ C25D *15/02*

U.S. Cl. 204—16 9 Claims



1. The method for codepositing a water-insoluble material with a metal from a plating solution having the metal ion dissolved and the water-insoluble material suspended therein, characterized by pumping at least one third per minute of the volume of the plating solution by means of a pump without entraining air bubbles, and injecting the thus pumped volume downward into the bath through a plurality of holes in the lower side of a sparger pipe connected to said pump and located at a lower level in a plating tank, thereby circulating and fluidizing the plating solution in which codeposition is being carried out.

4,441,966

ELECTROPLATING APPARATUS AND METHOD

Tsutomu Onda, Nishio; Keiichi Kano, Nagoya, and Shinji Itakura, Hekinan, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 16, 1981, Ser. No. 312,354

Claims priority, application Japan, Oct. 16, 1980, 55-144889

Int. Cl.³ C25D *7/04, 17/00, 17/06*

U.S. Cl. 204—26 7 Claims

5. A method of electroplating an article, said method comprising the steps of:

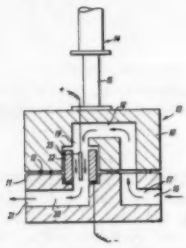
(a) providing a first member having therein an inlet port into which plating fluid is supplied during plating operations, a first passageway in fluid communication with said inlet port and with a working face of said first member, an outlet port, and a third passageway in fluid communication with said outlet port and with said working face of said first member;

(b) providing a second member having therein a second

passageway in fluid communication at both ends with a working face of said second member;

(c) the working faces of said first and second members defining a chamber therebetween which is in fluid communication with one end of said second passageway and with either said first passageway or said second passageway during plating operations, the other of said first or second passageways being simultaneously in fluid communication with the other end of said second passageway;

(d) placing the article to be plated in said chamber;



(e) connecting a first electrode means to the article to be plated;

(f) providing a second electrode means in position to cooperate with said first electrode means to electroplate the article;

(g) causing the plating fluid to flow through said chamber in one direction without doubling back on itself; and

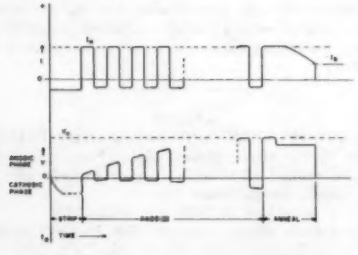
(h) providing an electroplating voltage differential between said first and second electrodes.

4,441,967

METHOD OF PASSIVATING MERCURY CADMIUM TELLURIDE USING MODULATED DC ANODIZATION

Juergen L. W. Pohlmann, Alexandria, Va., and Michael Martinka, Gaithersburg, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1982, Ser. No. 452,681
Int. Cl.³ C25D *11/32*
U.S. Cl. 204—29 **5 Claims**



1. In a method of passivating a mercury cadmium telluride surface on a workpiece comprised of a mercury cadmium telluride layer on a substrate, wherein the workpiece is passivated by the following steps:

attach the workpiece to one electrode of an electrolytic circuit;

immerse the workpiece in an electrolyte in which a second electrode of said electrolytic circuit is immersed; the improvement comprising the following steps:

energize the electrolytic circuit with the workpiece as the cathode in the circuit, to strip surface oxide layers from the layer surface;

energize said electrodes to anodize the layer surface with a generally square current wave having an anodic phase wherein the workpiece is energized as the anode in said electrolytic circuit and a cathodic phase in which the workpiece is energized as the cathode in said electrolytic circuit, and wherein the current in the cathodic phase is less than the current in the anodic phase, and, when a predetermined voltage is reached between said electrodes;

energize with the workpiece as the anode using an essentially constant voltage until the current drops to a predetermined value to anneal the workpiece; and

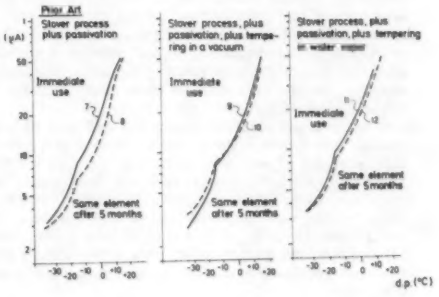
remove the workpiece from the electrolyte and deenergize said circuit.

4,441,968

METHOD OF MANUFACTURE OF AN ELECTRIC HUMIDITY DETECTING SENSING ELEMENT

Ivan Emmer; Zdenek Hajek, and Petr Repa, all of Prague, Czechoslovakia, assignors to Matematicko-fyzikalni fakulta University Karlovy v Praze, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 158,819, Jun. 12, 1980, abandoned. This application Dec. 1, 1981, Ser. No. 326,285
Claims priority, application Czechoslovakia, Jul. 12, 1979, 4887-79
Int. Cl.³ C25D *11/18*; G01N *25/56*
U.S. Cl. 204—35 N **5 Claims**


Prior Art
Stover process plus passivation
Immediate use
Same element after 5 months
Stover process, plus passivation, plus tempering in a vacuum
Immediate use
Same element after 5 months
Stover process, plus passivation, plus tempering in water vapor
Immediate use
Same element after 5 months
d.p. (°C)

1. In a method of manufacturing an electric humidity detecting sensing element by anodically oxidizing a polished aluminum surface by alternating current of a density of about 12 mA/sq.cm using an electrolyte of 50% sulphuric acid at a temperature of 33° C. for 25 minutes to provide a porous layer of aluminum oxide and sealing the porous layer in boiling water, the improvement in combination therewith which comprises prior to preparing an upper electrode, tempering said layer for a time ranging from 2 to 24 hours at a temperature of from 70° to 110° C. in an atmosphere which is chemically inert relative to said aluminum oxide layer, said atmosphere containing water vapor in an amount of from zero to that corresponding to the dew point of 65° C., thereby stabilizing surface properties of said layer with respect to a reversible absorption of water vapor.

4,441,969

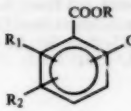
COUMARIN PROCESS AND NICKEL ELECTROPLATING BATH

Robert A. Tremmel, Woodhaven, Mich., assignor to OMI International Corporation, Warren, Mich.

Filed Mar. 29, 1982, Ser. No. 362,940
Int. Cl.³ C25D *3/18*
U.S. Cl. 204—49 **36 Claims**

1. An aqueous acidic nickel electroplating bath comprising a coumarin compound and an aryl hydroxy carboxylic acid

compound corresponding to the following general structural formula:



wherein:

R is —H, or M, wherein M is a bath soluble cation,

R_1 is —H, —OH, —CH_3, —C_2H_5, —OCH_3, —OC_2H_5, or a halogen,

R_2 is —H, —COOH, —CH_3, —C_2H_5, —OCH_3, —OC_2H_5, or a halogen,

as well as mixtures thereof; present in a combined amount effective to provide a ductile, self-leveling semi-bright nickel deposit.

4,441,970

ELECTROCHEMICAL PREPARATION OF 2,5-DIALKOXY-2,5-DIHYDROFURANS

Dieter Degner, Dannstadt-Schauernheim, and Heinz Hannebaum, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 18, 1982, Ser. No. 435,037

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142626

Int. Cl.³ B01D *3/34*

U.S. Cl. 204—59 R **14 Claims**

1. A process for the preparation of a 2,5-dialkoxy-2,5-dihydrofuran of the formula

I

where R is alkyl of 1 to 4 carbon atoms, which comprises:

electrochemically oxidizing 2,5-dihydrofuran in an electrolyte containing an alkanol of the formula ROH.

4,441,971

PROCESS AND APPARATUS FOR REDUCING SOOT

Tomoji Ishiguro, and Yoshimi Kizaki, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Continuation of Ser. No. 185,571, Sep. 9, 1980, abandoned. This application Dec. 23, 1982, Ser. No. 452,868

Claims priority, application Japan, Sep. 20, 1979, 54-121331; Mar. 6, 1980, 55-28952

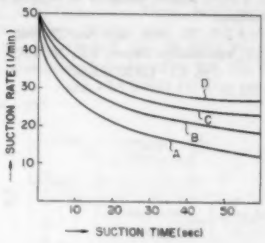
Int. Cl.³ F01N *3/00;* **B01J** *1/00, 8/00*

U.S. Cl. 204—164 **3 Claims**

1. A process for reducing soot in exhaust gases from an automobile Diesel engine which comprises:

introducing soot-containing exhaust gases from an automobile Diesel engine into a container;

applying to said soot-containing exhaust gases an alternating or pulsating voltage in the range of from 100 v/cm to 10,000 v/cm and having a frequency in the range of from 10 Hz to 250 Hz to break masses of soot particles, each mass having a diameter of at least 0.2 micron, into individual finer particles, each having a diameter not greater than several hundred angstroms; and



discharging said gases out of said container.

4,441,972

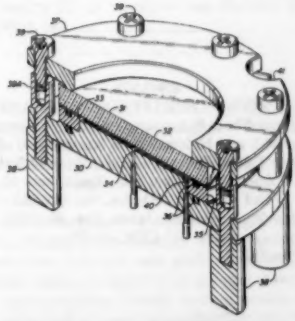
APPARATUS FOR ELECTROFUSION OF BIOLOGICAL PARTICLES

Herbert A. Pohl, Stillwater, Okla., assignor to D.E.P. Systems, Inc., Metamora, Mich.

Filed Apr. 8, 1983, Ser. No. 483,290

Int. Cl.³ B01D *57/02*

U.S. Cl. 204—180 R **7 Claims**



1. A method for fusing neutral polarizable bodies comprising the steps of

generating a non-uniform electric field in a chamber defined by at least two parallel and cofacially disposed electrodes, at least one of said electrodes having a surface comprising a plurality of substantially concentric grooves, and said chamber provided with inlet means being centrally disposed to said grooves;

introducing said bodies into said chamber through said inlet means;

exposing said bodies in said chamber to said field to align said particles contiguously between said electrodes;

imposing a direct current impulse to said electrodes, thereby fusing said contiguously aligned said bodies;

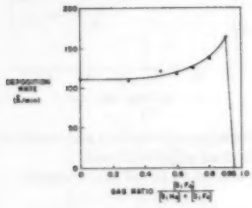
withdrawing the fused bodies from said chamber.

4,441,973

METHOD FOR PREPARING A THIN FILM AMORPHOUS SILICON HAVING HIGH RELIABILITY

Kesao Noguchi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 287,940
Claims priority, application Japan, Jul. 30, 1980, 55-104518
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 N 23 Claims



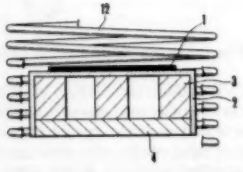
1. A method for preparing a semiconductor film by utilizing an ion-plating method, comprising the steps of disposing a substrate within a reaction chamber, providing a semiconductor material, applying an ion accelerating voltage between said substrate and said semiconductor material, evaporating said semiconductor material to supply an evaporated semiconductor gas into said reaction chamber, introducing a fluoride gas of semiconductor material into said reaction chamber, generating a high frequency electric field within said reaction chamber, and controlling a gas pressure within said reaction chamber so that said high frequency electric field causes ionization of said evaporated semiconductor gas but precludes a sputtering of said semiconductor material, whereby said evaporated semiconductor gas is ionized within said reaction chamber and an amorphous semiconductor film containing fluorine is deposited on said substrate.

4,441,974

MAGNETRON SPUTTERING APPARATUS

Reiji Nishikawa; Shozo Satoyama, both of Yokohama; Yoshinori Ito, Chigasaki, and Hidetaka Jyo, Sagamihara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Tokuda Seisakusho, Ltd., Zama, both of, Japan

Filed Apr. 28, 1983, Ser. No. 489,593
Claims priority, application Japan, Apr. 30, 1982, 57-71556
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 16 Claims



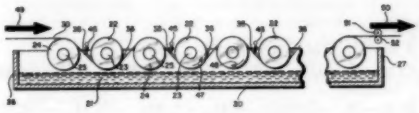
1. A magnetron sputtering apparatus comprising a sputtering chamber; a substrate and target disposed within said sputtering chamber to form a desired space therebetween; means for applying a voltage between said substrate and target; and means for producing a magnetic field so that the direction of the magnetic field is inverted on the magnetic symmetry axis within said space.

4,441,975

ELECTROTREATING APPARATUS WITH ELECTRODE ROLL

William A. Carter, Munster, and Frank A. Martin, Merrillville, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Feb. 17, 1983, Ser. No. 467,360
Int. Cl.³ C25D 17/00, 17/12
U.S. Cl. 204—206 7 Claims



1. In an apparatus for conducting an electrotreating operation on a continuous metal strip:

a cylindrical electrode roll composed of electrically conductive material and having an outer surface;

said electrode roll having an initial outside diameter;

means for wrapping a portion of a continuous metal strip around a portion of said electrode roll;

a porous mesh layer, composed of non-conductive material, disposed around said outer surface of the electrode roll;

said mesh layer comprising means for maintaining said wrapped-around portion of the metal strip in non-contacting, spaced relation to said outer surface of the electrode roll;

means for introducing an electrolytic liquid into the space between said metal strip and said outer surface of the electrode roll;

said porous mesh layer comprising means for maintaining said electrolytic liquid in said space while said strip portion is wrapped around said portion of the electrode roll;

said last recited means comprising means on said porous mesh layer defining, on the outer surface of the electrode roll, a plurality of open sites separated by side walls;

the width of said side walls being relatively small compared to the width of said open site;

and means fixedly securing said mesh layer to said outer surface for maintaining the outside diameter of said electrode roll at said initial diameter substantially throughout said electrotreating operation.

4,441,976

DEVICE FOR ELECTROLYTIC SURFACE TREATMENT OF MECHANICAL WORKPIECES

Giuliano Iemmi; Michele Raimondo, and Luigi Mo, all of Turin, Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed Oct. 29, 1981, Ser. No. 316,389
Claims priority, application Italy, Oct. 29, 1980, 68650 A/80
Int. Cl.³ C25D 17/04, 17/06, 7/04
U.S. Cl. 204—224 M 7 Claims

1. A device for electrolytic surface treatment of mechanical workpieces, including a head and a counter-head, respective support means for the head and counter-head, the head and counter-head having respective parts which can be applied in a liquid-tight manner against respective ends of a said workpiece arranged vertically, an anode arranged to extend along the axis of said workpiece in use, and means for circulating a liquid electrolyte around a closed circuit taking it through the interior of said workpiece, said circulation means including a reservoir spaced from the head and counter-head and a circulation pump, wherein the improvement consists in:

the head being electrically-conductive to provide a cathode contact for said workpiece, and being mounted fixedly in a working plane by its said support means;

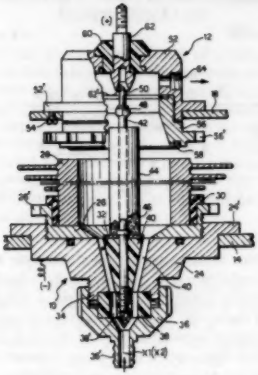
the counter-head being supported by its said support means in such a way as to be movable towards and away from the head;

means being provided to urge the counter-head axially

against the upper end of said workpiece when the latter is resting vertically on the head;

electrically-insulating means supporting the base of said anode on the head,

the anode having a contact terminal at its upper end, and the counter-head having a central anode current contact



member engaging the said contact terminal when the counter-head is pressed against the workpiece, and

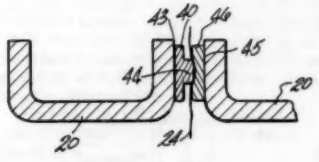
the head and the counter-head defining respective passages for the entry of said electrolyte at one end of the workpiece and the exit of the electrolyte from the other end of the workpiece.

4,441,977

ELECTROLYTIC CELL WITH SEALING MEANS

James M. Ford, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 5, 1980, Ser. No. 204,127
Int. Cl.³ C25B *9/00, 13/08*
U.S. Cl. 204—252 **8 Claims**



1. An electrolytic cell which comprises:

a. a first frame member housing an electrode,

b. a second frame member housing an electrode,

c. a separator positioned between said first frame member and said second frame member,

d. a first sealing means contacting a planar side of said first frame member and one side of said separator,

e. a second sealing means contacting a planar side of said second frame member, said second sealing means having a level first portion and a level second portion separated by a raised portion, said raised portion contacting the other side of said separator, the area of contact between said raised portion of said second sealing means and said separator is less than the area of contact between said first sealing means and said separator, and

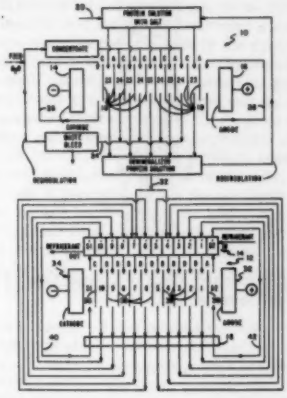
f. pressing means for pressing said frames together against said sealing means and said separator so as to form a substantially fluid-tight seal.

4,441,978

SEPARATION OF PROTEINS USING ELECTRODIALYSIS - ISOELECTRIC FOCUSING COMBINATION

Surendar M. Jain, Watertown, Mass., assignor to Ionics Incorporated, Watertown, Mass.

Division of Ser. No. 278,267, Jun. 29, 1981, Pat. No. 4,396,477.
This application Feb. 16, 1983, Ser. No. 466,821
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—301 **4 Claims**



1. Apparatus for the treatment of protein containing liquids comprising an electrodialysis membrane cell for desalting said liquids having substantially alternating desalting and concentrating chambers in combination with a isoelectric focusing membrane cell having substantially parallel channels with conduit means for passing the resulting desalted liquids from said electrodialysis cell into a reservoir and further conduit means for passing the said liquid to said channels of said isoelectric focusing cell.

4,441,979

NUTATING PROBE FOR GAS ANALYSIS

Leo L. Dailey, Philadelphia, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed May 31, 1983, Ser. No. 499,777
Int. Cl.³ G01N *27/30*
U.S. Cl. 204—402 **9 Claims**

1. A probe immersible in a liquid having a gas dissolved therein and adapted to continuously and accurately measure the concentration of the gas, said probe comprising:

A. a hollow casing provided with an upper motor chamber and a lower chamber having an open mouth, the casing being supported in a vertical position for immersion in the liquid by a flexible coupling attached to the upper end thereof, whereby the probe is deflectable from its normal vertical axis;

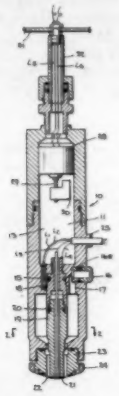
B. a noble metal measuring electrode disposed in said electrolyte chamber adjacent said open mouth;

C. a diffusing membrane covering said open mouth, said membrane being permeable to the gas to be measured;

D. an oxidizable metal counter-electrode disposed in said electrolytic chamber, the chamber being filled with an electrolyte which bridges the electrodes to form a gas-sensitive electro chemical cell generating a current which is a function of the dissolved gas diffusing through said membrane; and

E. a motor mounted in said motor chamber and having a shaft to which is attached an unbalanced rotor mass,

whereby when the motor is energized, the rotating mass causes the probe to nutate relative to its normal vertical



axis to simulate the effect of a rapid flow of the liquid relative to the membrane.

4,441,980

APPARATUS FOR DETERMINING UNDERWATER POTENTIAL DIFFERENCES EMPLOYING LUGGINS TUBULUS

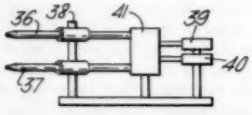
Michael A. Warne, Brewood, England, assignor to Global Cathodic Protection Ltd., Shropshire, England

Filed May 4, 1982, Ser. No. 374,727

Claims priority, application United Kingdom, May 9, 1981, 8114232

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—409 **20 Claims**



1. Apparatus for use in measuring an electric potential at or a potential difference between each of two spaced underwater positions, the apparatus including two probe tubes, each probe tube having an outer open end and an inner end which is capable of being electrically coupled to the outer end by fluid means within the tube, fluid coupling valve means, a reference electrode or half cell, the inner end of each probe tube being connected to the fluid coupling valve means for selective coupling of electric current at said outer end via fluid means to the reference electrode or half cell, a further electrode, and means to determine the difference between the potential at the outer open end of a tube as it appears at the reference electrode or half cell and the potential at the further electrode.

4,441,981

GAS SENSOR

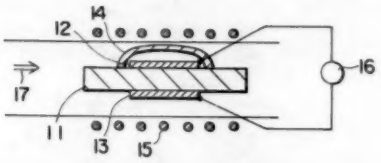
Hiroshi Okamoto, Ohme; Michiharu Seki, Kodaira, and Hidehito Ohayashi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 36,862, May 7, 1979, abandoned. This application Jul. 15, 1980, Ser. No. 169,137

Claims priority, application Japan, May 10, 1978, 53-54501

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—426 **19 Claims**



1. A gas sensor comprising a solid electrolyte which has an oxygen ion conductivity, a first electrode which is covered with an oxidizing catalyst for oxidizing a combustible gas to-be-detected contained in air, and a second electrode which is made of the same material as that of said first electrode and having a surface that comes into direct contact with the air containing the gas to-be-detected, said oxidizing catalyst and said first and second electrodes being disposed on said solid electrolye, and means for causing the air containing the gas to-be-detected to contact the oxidizing catalyst covering the first electrode and the contact surface of the second electrode so that the concentration of the combustible gas contained in the air is sensed and known from an electromotive force generated across said first and second electrodes.

4,441,982

COMBUSTION SENSING APPARATUS

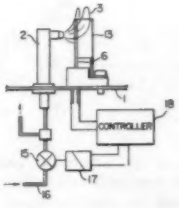
Sadayasu Ueno, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 12, 1982, Ser. No. 377,411

Claims priority, application Japan, May 15, 1981, 56-72352

Int. Cl.³ G01N *27/58*; F23N *5/00*

U.S. Cl. 204—426 **5 Claims**



1. A combustion sensing apparatus comprising a combustion sensor disposed in the vicinity of a burner and a flame jetted thereby, said combustion sensor being formed of a solid electrolyte having a cathode formed on a surface of the solid electrolyte that is oriented so as to be subjected to the flow of a hot combustion gas produced in the vicinity of said flame, and an anode formed on a surface of said solid electrolyte subjected to an atmosphere of a reference gas, characterized in that said solid electrolyte has a tabular form and is provided with said anode and cathode on opposite surfaces of a free end thereof, said apparatus further having a shielding member mounted to a support means so as to be positioned adjacent the side of the free end of the solid electrolyte upon which said anode is formed in a manner so as to prevent the flame jetted

from said burner from extending to the same side of said solid electrolyte as said anode.

4,441,983

ZINC SULFIDE LIQUEFACTION CATALYST

Diwakar Garg, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 19, 1982, Ser. No. 409,469
Int. Cl.³ C10G *1/08*
U.S. Cl. 208—10 **6 Claims**

1. In a process for the liquefaction of solid carbonaceous material at elevated temperature and pressure in the presence of a solvent for the carbonaceous material, hydrogen and a hydrogenation catalyst to produce a predominantly liquid product, the improvement comprising the use of an activated zinc sulfide hydrogenation catalyst which is activated by subjecting preformed zinc sulfide to a hydrogenation atmosphere comprising substantially hydrogen at up to 900° F. in solvent for the carbonaceous material but in the absence of said carbonaceous material.

4,441,984

RECOVERY OF OIL FROM OIL-BEARING LIMESTONE

Robert P. Guerre, Seabrook, Tex., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 24, 1980, Ser. No. 219,675
Int. Cl.³ C10G *1/00, 1/04*
U.S. Cl. 208—11 LE **12 Claims**

1. A process for recovering hydrocarbon liquids from oil-bearing rock composed primarily of limestone which comprises:

(a) separating said oil-bearing rock into a low density fraction containing oil-rich limestone particles and a high-density fraction containing oil-lean limestone particles;

(b) contacting said low-density fraction containing said oil-rich limestone particles with an organic solvent in an extraction zone thereby extracting said oil from said oil-rich limestone particles; and

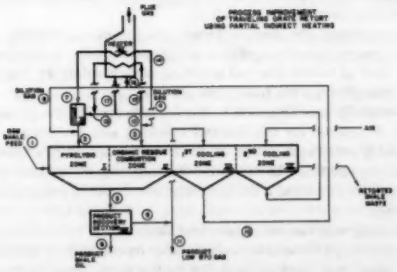
(c) recovering the extracted oil from said organic solvent as said hydrocarbon liquids.

4,441,985

PROCESS FOR SUPPLYING THE HEAT REQUIREMENT OF A RETORT FOR RECOVERING OIL FROM SOLIDS BY PARTIAL INDIRECT HEATING OF IN SITU COMBUSTION GASES, AND COMBUSTION AIR, WITHOUT THE USE OF SUPPLEMENTAL FUEL

James E. Burchfield, Scotch Plains, and Robert C. Green, Berkley Heights, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 8, 1982, Ser. No. 355,850
Int. Cl.³ C10G *1/00*; C10B *53/06, 49/06*
U.S. Cl. 208—11 R **5 Claims**



1. In a process for the recovery of an organic oil from an organic oil-bearing solid wherein said solid, in particulate form, is transported through a series of zones inclusive of a pyrolysis zone, and wherein is included an organic residue combustion zone, one of more cooling zones, an external combustor wherein product gas generated from within the process is recycled and burned with an oxygen-containing gas to supply heat for the pyrolysis zone, and a product recovery zone from which product oil and product gas produced in the pyrolysis and organic residue combustion zones are recovered,

pyrolysis is carried out in the pyrolysis zone by contacting the organic oil-bearing solid with a hot non-reactable gas essentially devoid of oxygen to remove from the solid a product organic oil and product gas, the oil-containing gas being injected into the product recovery zone,

the hot non-reactable gas employed in the pyrolysis zone is generated in situ within the process by burning some of the product gas with an oxygen-containing gas in a combustor external to the pyrolysis zone, and the combustion gases quenched with a portion of the recycled product gas as dilution gas to moderate the temperature to a satisfactory level for injection into the pyrolysis zone,

the solid, which contains an organic residue after removal of organic oil, is transported from the pyrolysis zone to the organic residue combustion zone and contacted with a recycle gas to which is added sufficient of an oxygen-containing gas to combust with the organic residue of the pyrolyzed solid to produce process heat, and the products of the combustion are injected into the product recovery zone,

the product organic oil and product gas from the pyrolysis and organic residue combustion zones are separated into a product oil, and a product gas a portion of which is heated in a cooling zone of the series and recycled, a portion of the product gas burned with an oxygen-containing gas in said combustion zone and another portion of the product gas as dilution gas used to quench and moderate the temperature of the combustion products from the combustion zone to a satisfactory level for injection into the pyrolysis zone,

the improvement comprising

adding to the process an indirect heater,

heating, in the external indirect heater, at least a portion of the recycled product gas,

burning within the external combustor, an admixture of the hot recycled product gas from the external indirect heater and an external oxygen-containing gas indirectly preheated by heat generated from within the process to form a non-reactable gas mixture essentially devoid of oxygen, and

injecting said mixture of burned gases into the pyrolysis zone to reduce the amount of combustion required for achieving the combustion gas temperature necessary for pyrolysis, to produce a gas product which can be burned with an oxygen-containing gas to supply process heat without necessity of using supplemental fuel.

4,441,986

SHALE RETORTING WITH INORGANIC REMOVAL PRIOR TO COMBUSTION

Lawrence R. Stowe, Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 14, 1983, Ser. No. 484,795
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—11 R **19 Claims**

1. A process for the recovery of hydrocarbon products and energy from oil shale, including separation of coke from shale, comprising:

(a) feeding raw shale into a surface retort;

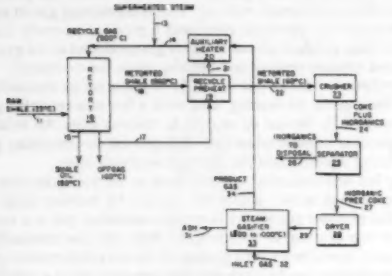
(b) retorting the raw shale in the retort to recover hydrocarbon products and produce coke on the inorganic matrix;

(c) removing the retorted shale from the retort;

(d) recovering sensible heat from the retorted shale;

(e) crushing the retorted shale to a size sufficient so that the coke and inorganic matrix may be separated;

(f) separating the crushed, retorted shale into a coke fraction and an inorganic matrix fraction;



(g) contacting the coke fraction with either superheated steam or air in order to form carbonaceous product gases at a temperature of 500° to 1000° C.; and

(h) recovering process heat from said product gases.

4,441,987

DEWAXING PROCESS USING AGITATED HEAT EXCHANGER TO CHILL SOLVENT-OIL AND WAX SLURRY TO WAX FILTRATION TEMPERATURE

Thomas E. Broadhurst, Sarnia, Canada, assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Mar. 20, 1981, Ser. No. 245,712

Int. Cl.³ C10G *73/08*

U.S. Cl. 208—33 **21 Claims**

7. A method of dewaxing hydrocarbon oils comprising diluting the waxy oil with dewaxing solvent, introducing the oil-solvent mixture into an indirect heat exchanger operated at a high level of agitation expressed in terms of Impeller Reynolds Number in the range of about 10,000 to 1,000,000 wherein the high level of agitation is achieved by means of an articulated multi-section shaft having blades radially attached thereto, each section of said shaft being supported by means of a steady bearing, chilling the oil-solvent mixture to the wax separation temperature whereby wax is precipitated to form a wax-oil-solvent slurry, and separating the precipitated wax from the wax-oil-solvent slurry in liquid-solid separation means.

4,441,988

CATALYTIC REFORMER PROCESS

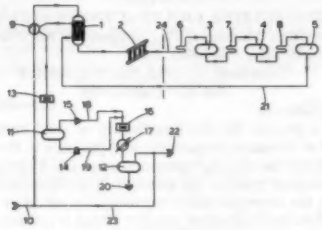
Robert L. Irvine, 214 Rec., 27040 Cedar Rd., Apt. Mark IV, Beechwood, Ohio 44122

Continuation-in-part of Ser. No. 43,784, May 30, 1979, abandoned. This application Jun. 4, 1981, Ser. No. 270,405

Int. Cl.³ C10G *35/04*

U.S. Cl. 208—64 **13 Claims**

1. A catalytic reformer process for the production of hydrogen and a product of enhanced aromatic content from a naphtha feedstock which process comprises a plurality of adiabatic reactor stages in which the feedstock is subjected to conversion to aromatic products, where the heat in the effluent from the terminal adiabatic reactor stage is utilized in an alkylcyclohexane converter, wherein said alkylcyclohexane converter has an ascending temperature pattern, by means of simultaneous heat-exchange, to provide the endothermic heat of reaction required in an alkylcyclohexane converter for the dehydrogenation to aromatics of the original alkylcyclohexanes in the feed.



4,441,989

PROCESS AND APPARATUS FOR THERMAL CRACKING AND FRACTIONATION OF HYDROCARBONS

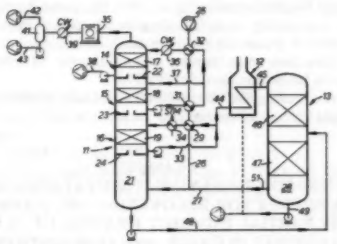
Peter Spencer, 9 Links Close, Ashtead, Surrey, England

Filed Sep. 23, 1982, Ser. No. 422,040

Claims priority, application United Kingdom, Nov. 3, 1981, 8133060

Int. Cl.³ C10G *51/04, 55/04*

U.S. Cl. 208—76 **13 Claims**



1. In a process for the thermal cracking of the heavy fraction of a petroleum crude oil feedstock, the steps including:

introducing said feedstock into the flash zone of a fractionator;

withdrawing a bottom stream of heavy fractions from said flash zone and feeding said stream of heavy fractions directly to a reactor;

withdrawing a heavy gas oil fraction from said fractionator;

heating said heavy gas oil;

introducing the heated heavy gas oil into a reactor and heating the stream of heavy bottom fractions to a temperature at which thermal cracking occurs solely by the heat supplied by the heavy gas oil; and

thermally cracking said heavy bottom fractions.

4. A process for the thermal cracking and fractionation of reduced petroleum crude oil feedstock, employing a thermal cracking reactor, a heater, and a fractionating column comprising a flash zone and a fractionating section, said process comprising:

feeding said feedstock into said flash zone;

removing a bottom stream of heavy fractions from said flash zone and feeding said heavy fractions directly to said reactor;

passing lighter fractions including a heavy gas oil fraction into said fractionating section;

removing from said fractionating section at least one light fraction product stream;

removing from said fractionating section a heavy gas oil stream and feeding said heavy gas oil to said heater and thence to said reactor;

subjecting said heavy fractions and said heavy gas oil to thermal cracking conditions in said reactor;

removing from said reactor a cracked vapour products stream and recycling said cracked vapour products whereby said cracked vapour products are introduced into said feedstream prior to said feedstream being introduced into said flash zone thereby quenching said cracked vapour products and heating said feedstream; and

withdrawing from said reactor a cracked liquid products stream.

4,441,990

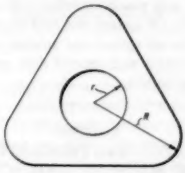
HOLLOW SHAPED CATALYTIC EXTRUDATES

Yun-Yang Huang, Voorhees, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 28, 1982, Ser. No. 383,070

Int. Cl.³ C10G *47/02*; B01J *35/00*; C07C *2/68, 2/02*

U.S. Cl. 208—111 **39 Claims**



1. A catalyst particle having a non-cylindrical centrally located aperture surrounded by a solid wall portion, a volume to surface ratio of less than about 0.02 inch and an external periphery characterized by having at least 3 points of contact when circumscribed by a cylindrical shape.

15. A process for the conversion of an organic charge which comprises contacting the same under conversion conditions with a catalyst comprising a crystalline aluminosilicate characterized by having a formed non-cylindrical particle configuration comprising a centrally located aperture surrounded by a solid wall portion, a volume to surface ratio of less than about 0.02 inch and an external periphery characterized by having at least 3 points of contact when circumscribed by a cylindrical shape.

4,441,991

CATALYTIC DEWAXING OF OILS CONTAINING AMMONIA OVER HIGHLY SILICEOUS POROUS CRYSTALLINE MATERIALS OF THE ZEOLITE ZSM-5 TYPE

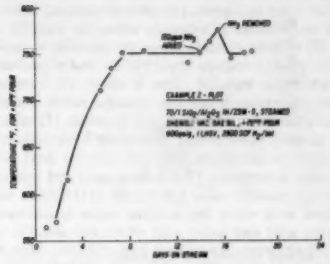
Francis G. Dwyer, West Chester, Pa., and William E. Garwood, Haddonfield, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 256,213, Apr. 21, 1981, abandoned. This application Oct. 20, 1982, Ser. No. 435,424

Int. Cl.³ C10G *47/16*

U.S. Cl. 208—111 **19 Claims**

1. In a hydrowaxing process, conducted at temperatures of between about 400° F. and about 825° F., pressures of between about 10 and about 2500 psig, liquid hourly space velocity of between about 0.1 and about 10, and molar ratios of hydrogen to hydrocarbon charge of between about 2 and about 80 and in an environment containing from 1 to 250 ppm of NH_3, for the selective cracking of straight-chain hydrocarbons and slightly branched-chain hydrocarbons from a mixture of the same with compounds of different molecular shapes, the improvement which comprises contacting said mixture with a highly siliceous porous crystalline material related to the zeolite ZSM-5



having a SiO_2/Al_2O_3 mole ratio of greater than about 200 and having an X-ray diffraction pattern as set forth in Table I.

4,441,992

DEMETALLIZATION OF HYDROCARBON CONTAINING FEED STREAMS

James B. Kimble, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 18, 1983, Ser. No. 485,792

Int. Cl.³ C10G *45/06*

U.S. Cl. 208—251 H **18 Claims**

1. A process for the demetallization of a hydrocarbon containing feed stream, which contains metals, comprising the step of contacting said hydrocarbon containing feed stream under suitable demetallization conditions with hydrogen and a catalyst composition comprising zirconium phosphate, cobalt phosphate and a metal phosphate where the metal is selected from the group consisting of nickel and vanadium.

4,441,993

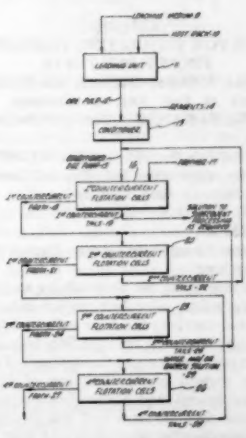
FLOTATION PROCESS

Frank P. Howald, Sunnyvale, Calif., assignor to Fluor Corporation, Irvine, Calif.

Continuation of Ser. No. 627,949, Nov. 3, 1975, abandoned. This application May 3, 1979, Ser. No. 35,634

Int. Cl.³ B03B *1/00*

U.S. Cl. 209—5 **8 Claims**



1. A process for recovering soluble metallic values selected from the group consisting of copper, uranium, gold, silver,

nickel, cobalt, zinc, aluminum, tungsten, titanium, antimony, barium and rhenium from a mixture comprising (A) said metallic values, (B) a solvent selected from the group consisting of (1) sulfuric acid, hydrochloric acid and ferric chloride when the metallic value is copper, (2) sulfuric acid and both sodium carbonate and sodium bicarbonate when the metallic value is uranium, (3) sodium cyanide when the metallic value is gold, (4) sodium cyanide, sodium hypochlorite and potassium hypochlorite when the metallic value is silver, (5) ammonia and ammonium carbonate when the metallic value is nickel, (6) sulfuric acid when the metallic value is cobalt, (7) sulfuric acid when the metallic value is zinc, (8) sodium hydroxide when the metallic value is aluminum, (9) hydrochloric acid when the metallic value is tungsten, (10) sulfuric acid and hydrochloric acid when the metallic value is titanium, (11) sodium sulfide or hydrochloric acid when the metallic value is antimony, (12) hydrofluoric acid and nitric acid when the metallic value is barium, (13) chlorine and sodium hypochlorite when the metallic value is rhenium, (C) at least one flotation reagent selected from the group consisting of collectors and modifiers, and (D) mineral impurities which are substantially insoluble in said selected solvent, said process comprising the steps of:

a. in a first flotation step, combining said mixture, with agitation, with a countercurrent tails stream from a second subsequent flotation step to thereby wash dissolved metallic values from said mineral impurities and dissolve undissolved metallic values;

b. floating the mineral impurities on the combined mixture to form a product solution of said metallic values and a first froth;

c. processing said product solution to yield said metallic values;

d. removing said first froth from said first flotation step and feeding it to the first of at least one subsequent flotation step wherein, in each subsequent flotation step, a froth from the preceding flotation step is mixed with a countercurrent stream to wash additional metallic values from said mineral impurities and dissolve additional undissolved metallic values, and a new froth and a countercurrent tails stream are formed, said countercurrent stream comprising the countercurrent tails stream from the next subsequent flotation step, and in the last subsequent flotation step, consisting of water, barren solution, said solvent for said metallic values or mixtures thereof; and

e. controlling the concentration and flow rate of said countercurrent stream to maintain predetermined concentrations of the metallic values in the advancing countercurrent tails streams and in said product solution.

4,441,994

APPARATUS FOR SEPARATING FOREIGN BODIES FROM FIBER TUFTS

Wolfgang Beneke, Mönchen-Gladbach, and Ferdinand Leifeld, Kempen, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 4, 1982, Ser. No. 345,769

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3103844; Mar. 11, 1981, 3109154

Int. Cl.³ B07B *3/00*

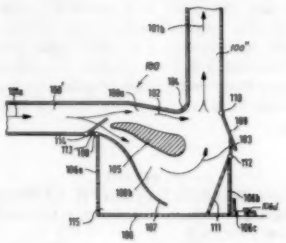
U.S. Cl. 209—139 R **13 Claims**

1. An apparatus for separating heavy foreign particles from fiber tufts comprising

(a) a duct for conveying the fiber tufts by an air stream; said duct having a first, inlet duct portion oriented in a first direction and carrying the fiber tufts and heavy foreign particles to be separated from the fiber tufts; and a second, outlet duct portion arranged downstream of said first duct portion as viewed in the direction of fiber tuft flow therein; said second duct portion being oriented in a second direction different from said first direction;

(b) a separating chamber situated in said duct between said first and second duct portions;

(c) a guide element extending from a downstream end of said first duct portion as a smooth continuation thereof and bounding said separating chamber; said guide element being oriented downwardly for guiding therealong the heavy foreign particles; said guide element having a lower terminal portion curving towards said second duct portion for guiding said air stream into said second direction; said lower terminal portion having a free lower end from



which the heavy foreign particles drop out of the separating chamber; and

(d) an air splitter in said separating chamber and being spaced from said guide element; said air splitter guiding one part of the air stream into said separating chamber on one side of the air spliter and guiding another part of the air stream towards said second duct portion on the other side of the air spliter.

4,441,995

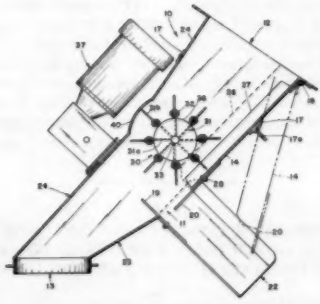
CHUNK SEPARATOR AND PROCESS OF SEPARATION FOR MACHINE TOOL SCRAP

Russell D. Dudley, Kalamazoo, Mich., assignor to Reclamet, Inc., Kalamazoo, Mich.

Filed May 12, 1983, Ser. No. 494,006

Int. Cl.³ B07B *4/02*

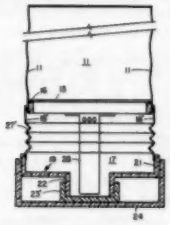
U.S. Cl. 209—137 **18 Claims**



1. Apparatus for separating large metallic pieces from an oil coated mixture of the metallic waste products of machining operations, said apparatus including a conduit having receiving and discharge ends and a bottom wall, an opening through said bottom wall intermediate said ends, a paddle wheel-type rotary metering element mounted in said conduit adjacent to and upstream of said opening for metering the movement of waste products through said conduit and providing an air seal between said receiving end and said opening, means for effecting rotation of said element, means for generating an air current through said opening such that the velocity of said air current is sufficient to entrain small metallic particles while permitting large metallic pieces to fall through said opening, said apparatus characterized in that said bottom wall beneath said element

has a movable section and means pivotally securing said section to said conduit between said element and said receiving end; means resiliently biasing said section into closed position whereby said section may be forced to pivot away from said metering element by a large metallic piece entering between said element and section.

4,441,996
APPARATUS FOR PRODUCING BACTERIA FREE DRINKING WATER
Richard F. Hurst, 126 Steeplechase Rd., Devon, Pa. 19333
Filed Mar. 31, 1982, Ser. No. 363,666
Int. Cl.³ B01D *39/00*
U.S. Cl. 210—241 **10 Claims**



1. A flexible and collapsible apparatus for producing bacteria free drinking water from contaminated water comprising:

a sleeve shaped flexible non-porous contaminated water collector having a top open inlet end and a bottom closed filter end adapted to receive contaminated water therein,

a sub-micron porous bacteria membrane filter permanently connected to said bottom closed filter end of said water collector,

a flexible and expandable non-porous bacteria free holding chamber permanently connected to said bacteria filter and sealed on said water collection to form an axial extension of said water collector,

said flexible water collector being adapted to be squeezed to generate a uniform force on top of said contaminated water in said collector and to force said contaminated water through said sub-micron filter and into said holding chamber where it accumulates by gravity, and

bacteria free exit means connected to the bottom of said holding chamber for removing bacteria free drinking water from said holding chamber without subjecting said drinking water to said contaminated water.

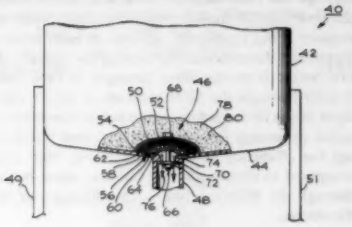
4,441,997
LIQUID FILTRATION SYSTEM
Larry D. Fields, Mira Loma, Calif., assignor to Yardney Electric Corporation, Pawcatuck, Conn.
Filed Feb. 25, 1983, Ser. No. 469,888
Int. Cl.³ B01D *25/06, 25/08*
U.S. Cl. 210—266 **5 Claims**

1. An improved liquid filtration system, such system comprising, in combination:

a. a vessel having a plurality of spaced interconnected walls defining a central cavity and having a liquid inlet and a liquid outlet;

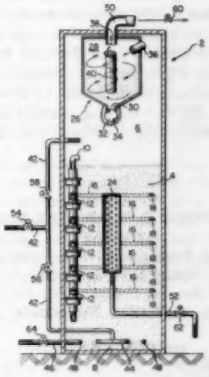
b. a porous, self-supporting rigid filter comprising a self-supporting body formed of a plurality of granules cemented together by set organic resin, said filter including a domed porous metallic plate disposed around said body, said body occupying only that portion of said vessel cavity which is adjacent said outlet, said body being arched over said outlet in a structurally stable configuration;

c. connector means releasably securing said body in said cavity adjacent said outlet so as to cover said outlet; and,



d. a mass of loose particles of filtering medium disposed above and around said rigid filter in said cavity and supported thereby.

4,441,998
WATER PURIFICATION DEVICE
Yoshihiko Ueda, Yamaguchi, Japan, assignor to Takara Kogyo Co., Ltd., Tokyo, Japan, a part interest
Filed Aug. 24, 1982, Ser. No. 410,920
Claims priority, application Japan, Mar. 12, 1982, 57-39092
Int. Cl.³ B01D *23/16*
U.S. Cl. 210—275 **12 Claims**



1. A water purification device for filtering raw water, comprising:

a filter tank having a major dimension and designed and dimensioned to hold a body of filter medium which substantially fills said tank, said tank having raw water inlet means and filtered water outlet means;

a plurality of flow passage defining means mounted in said filter tank and spaced at intervals along the inner peripheral surface of the sidewall of said filter tank in the direction of the major dimension of said filter tank, said flow passage defining means being designed and dimensioned for defining a plurality of raw water flow passages in said filter medium which extend along said flow passage defining means;

raw water supply means connected to said flow passage defining means for supplying raw water from said inlet means into said raw water flow passages from which the raw water disperses laterally from the flow passages into the filter medium; and

a water collection strainer mounted substantially centrally in said filter tank and extending in the direction of the major

dimension and being positioned radially inwardly of said flow passage defining means and connected to said water outlet means for collecting purified water flowing through the filter medium from said raw water passages, the flow passage defining means and the water collection strainer being positioned relative to each other and designed and dimensioned for causing the laterally dispersed raw water from the flow passages to flow radially inwardly through the filter medium to utilize and annular layer of the filter medium extending in the direction of the major dimension for initial filtration and thereby increasing the efficiency of utilization of the filter medium as compared to simply filtering the raw water by flowing it through the filter medium in the direction of the major dimension.

4,441,999

STRAINER MEANS FOR PULP PURIFICATION

Rune H. Frykhult, Huddinge, Sweden, assignor to AB Celleco, Stockholm, Sweden

Filed Jan. 26, 1981, Ser. No. 228,569
Claims priority, application Sweden, Jan. 28, 1980, 8000651
Int. Cl.³ B01D *33/06*
U.S. Cl. 210—354 **10 Claims**

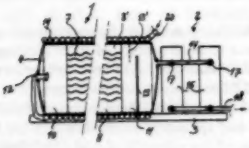
1. In a device for straining pulp, the combination of a housing having an inlet for a suspension, a strainer drum located within the housing and having a substantially circular cylindrical mantle provided with strainer openings, the mantle having between said openings slanting external surfaces which are inclined in relation to the circumferential direction of the mantle, said surfaces forming an attack angle against the flow direction of said suspension from the inlet, the inclination of said surfaces acting to give particles issuing from said inlet and contacting said surfaces a component of movement directed radially outward, the two slanting external surfaces adjacent each strainer opening lying in different planes.

4,442,000

EASILY TRANSPORTABLE WATER PURIFICATION DEVICE

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex Beheer B.V., Assondelft, Netherlands

Filed Jan. 21, 1982, Ser. No. 341,311
Claims priority, application Netherlands, Jan. 29, 1981, 8100443
Int. Cl.³ B01D *21/08*
U.S. Cl. 210—256 **6 Claims**



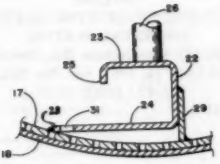
1. In a portable water purification device having a tank with an inlet and an outlet chamber and a plate separator arranged there between, which inlet chamber communicates with a supply connection, and which outlet chamber communicates with a filter assembly, the improvement comprising a tube coalescence apparatus between the supply connection and the inlet chamber having the form of a tube of resilient material wound around the tank in a single or multiple winding, said tube protecting said tank against damage from impact suffered during transport.

4,442,001

ROTARY VACUUM FILTER

Kent L. Davis, Salt Lake City, Utah, assignor to WesTech Engineering, Inc., Salt Lake City, Utah

Filed Sep. 27, 1982, Ser. No. 423,832
Int. Cl.³ B01D *33/06*
U.S. Cl. 210—402 **4 Claims**



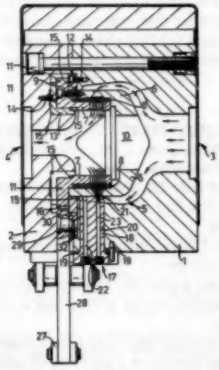
1. In a rotary drum vacuum filter: an improved drum comprising a single cell defined by a perforated cylindrical wall and solid end walls; a hollow shaft extending axially of the drum axis and from at least one end of the drum; means for connecting said shaft to a source of vacuum; a plurality of elongated open-topped pans inside said drum spaced angularly about and radially from said shaft; each of said pans being defined by spaced apart inner and outer side walls, a bottom wall, and the drum end walls; a closed conduit for each pan connecting the interior thereof with the interior of said hollow shaft; each of said pans is positioned with its outer wall adjacent and spaced from the inner drum wall and its open top facing in the direction of rotation of said drum; means securing the upper edge of said outer pan wall to said drum wall along a continuous line of connection adjacent the open top of said pan; and a plurality of ports in said outer pan wall adjacent to and spaced apart along said continuous line of connection.

4,442,002

FILTRATION DEVICES

Peter A. Morris, Southampton, England, assignor to Cresta Technology Limited, Chichester, England

Filed Jul. 28, 1982, Ser. No. 402,676
Claims priority, application United Kingdom, Aug. 5, 1981, 8123933
Int. Cl.³ B01D *33/06, 35/12, 35/22*
U.S. Cl. 210—411 **12 Claims**



1. A screening device for removing foreign matter from fluid plastic material, comprising elements designed, arranged and dimensioned to minimize pressure fluctuations during treatment of plastic polymers at up to the highest pressures and

temperatures at which such polymers can be treated, including,

(a) a filter drum arranged to receive material to be filtered at its outer surface and to deliver filtered material from its interior, said material having been filtered by passage through the wall of said drum from the exterior to the interior thereof;

(b) means for cleansing the external surface of said filter drum by selective back flow of filtered material from the interior to the exterior of said drum so as to flush away deposited foreign matter, said cleansing means comprising a manifold member in seating engagement with a limited area of the external surface of said drum to provide for a flow of filtered material from the drum interior through said limited area of the drum external surface and into said manifold member, and means for rotating said drum so as to cause different areas of the external surface thereof to register successively with said manifold member and to be cleansed by said back flow of filtered material;

(c) said filter drum comprising an inner and an outer cylindrical filter barrel adapted to receive therebetween a cylindrical filter screen, said outer barrel having a plurality of relatively large spaced apart openings in its outer surface each of which communicates via a passageway through the thickness of the barrel wall with a correspondingly large opening in the inner surface of said barrel, said inner barrel having through apertures of such small size that a plurality thereof register with each of said openings in the inner surface of said outer barrel, and said manifold member being dimensioned to seat with an area of the external surface of said outer filter barrel corresponding to one of the said openings therein.

4,442,003

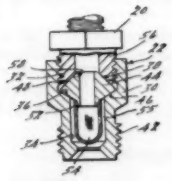
FILTER ASSEMBLY

Earl R. Holt, Rochester, Mich., assignor to Hose Specialties Company, Detroit, Mich.

Filed Sep. 30, 1982, Ser. No. 430,326

Int. Cl.³ B01D *27/08, 35/02*

U.S. Cl. 210—445 **6 Claims**



1. An inline filter assembly adapted for use in a paint spray supply system comprising an integral tubular body member formed with a throughbore having an annular tapered shoulder intermediate the upstream and downstream ends thereof, said body member formed with an internal thread in the downstream portion of said bore extending inwardly toward said tapered shoulder for threadably receiving a threaded male connection formed with a conically tapered seat at the end thereof, a removable filter element comprising an annular ferrule formed with a first annular conical sealing seat disposed in seated sealing relationship on said tapered shoulder and a second annular conical sealing seat disposed in seated sealing relationship on the conically tapered seat of the male connection and removably clamped therebetween, a thimble-shaped filter screen affixed to said ferrule adjacent to said first conical seat and projecting axially within said bore toward said upstream end, and means on the upstream end portion of said body member for connecting said filter assembly to a paint supply system.

4,442,004

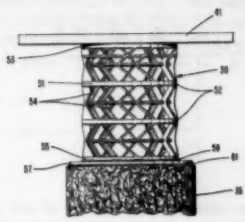
BIASING ARRANGEMENT AND FILTER UNIT FOR A FILTERING APPARATUS

Zan P. Smith, Summit, and Frank Haimbach, IV, Nutley, both of N.J., assignors to Osmonics, Inc., Minnetonka, Minn.

Filed Jul. 1, 1982, Ser. No. 394,195

Int. Cl.³ B01D *29/32*

U.S. Cl. 210—448 **23 Claims**



1. A biasing arrangement for use with a filter element having a longitudinal bore therethrough, the biasing arrangement comprising a spring element having first and second ends, said spring element being comprised entirely of a plastic material and being deformable by pressure applied in a direction generally along an axis extending between said first and second ends, a generally planar sealing disk adapted to seal an end of the longitudinal bore of the filter element, said sealing disk being comprised entirely of a plastic material, and said sealing disk being permanently positively secured to an end of said spring element.

11. A filter unit for use in a filtering apparatus employing at least one filter unit, said filter unit comprising an elongated filter element including filtering material and having a longitudinal bore therethrough, a spring element having first and second ends, said spring element being deformable by a pressure applied in a direction generally along an axis extending between said first and second ends, a sealing disk for sealing an end of the longitudinal bore of the filter element, said sealing disk being positively directly secured to both an end of said spring element and an end of said filtering material such that said spring element, said sealing disk and said filter element define an integral unit, said spring element, said sealing disk and said filtering material each being comprised of a plastic material.

4,442,005

METHOD OF AND APPARATUS FOR THE BIOLOGICAL DECONTAMINATION OF WASTE WATER

Edmund J. Breider, Getzville, N.Y., assignor to Linde Aktiengesellschaft, Höllriegelskreuth, Fed. Rep. of Germany

Filed Apr. 13, 1982, Ser. No. 367,990

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, 3115104

Int. Cl.³ C02F *3/26*

U.S. Cl. 210—614 **6 Claims**

1. A method of biologically treating an influent waste water having variable organic waste loading which comprises the steps of:

(a) contacting said waste water with recycled sludge and aerating same in at least one activation basin to decompose organic components in said waste water and produce a suspension;

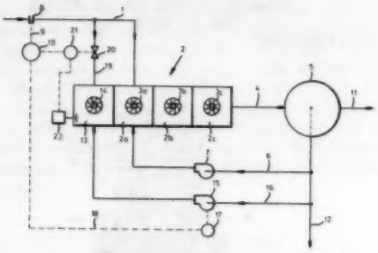
(b) withdrawing said suspension and separating same into an effluent and sludge in at least one clarifier;

(c) recycling at least a portion of the sludge separated in step (b) to the activation basin of step (a);

(d) monitoring the waste loading of said waste water;

(e) only upon the monitored waste loading said waste water exceeding a predetermined threshold, aerating at least a portion of the sludge recycled in step (c) prior to introduc-

tion of the recycled sludge into said activation basin in step (a) in an aeration basin which is not spatially separated from the activation basin; and



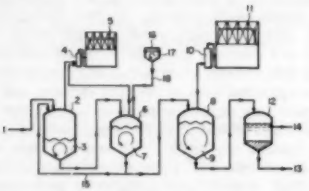
(f) upon the monitored waste loading of said waste water reaching a maximum, introducing a portion of the influent waste water to said aeration basin to flush aerated sludge from said aeration basin into said activation basin.

4,442,006

ANAEROBIC DIGESTION PROCESS

Masahiko Ishida; Ryooichi Haga, and Yoji Odawara, all of Hitachi, Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 140,677, Apr. 15, 1980, abandoned.
This application Dec. 3, 1981, Ser. No. 327,227
Claims priority, application Japan, Apr. 24, 1979, 54-49751
Int. Cl.³ C02F *3/28*
U.S. Cl. 210—613 **18 Claims**



1. An anaerobic digestion method for organic wastes consisting essentially of:

partially liquefying an organic waste slurry in the presence of liquefying bacteria of the facultative anaerobic bacteria group which are capable of converting organic materials to volatile fatty acid, while stirring without adjusting pH under an anaerobic condition to obtain a stable organic waste slurry; and

thereafter, liquefying and gasifying the treated slurry by adding to said slurry liquefying bacteria and gasifying bacteria of the obligatory anaerobic bacteria group which are capable of fermenting methane.

4,442,007

ACTIVATED SEAWATER WASTEWATER TREATMENT SYSTEM

Russell H. Rehm, 1505 Washington St., Bath, Me. 04530

Filed Sep. 28, 1982, Ser. No. 425,581
Int. Cl.³ C02F *3/02*
U.S. Cl. 210—631 **12 Claims**

1. A process for treating sewage and waste material for making it suitable for discharge into tidal waters comprising the steps of: activating seawater with hydrogen peroxide by dissolving the hydrogen peroxide in said seawater; delivering said activated seawater to a source of waste material and mixing said activated seawater with said waste material; transporting said waste material with said activated seawater mixture to at least one reaction vessel whereby said activated seawater decomposes said waste material; providing a separate continuous supply of said activated seawater to said reaction vessel to

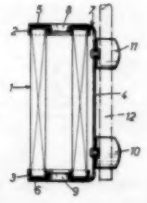
insure continuous aerobic biochemical reaction with solids in said reaction vessel; filtering the treated wastewater in a filtering vessel after it is discharged from said reaction vessel and discharging said filtered and treated wastewater to a disposal location.

4,442,008

PROCESS FOR PURIFYING THE ACTIVE LIQUID WITHIN HYDRAULIC CONTROL CIRCUITS

Georges J. C. Seurin, Izon, France, assignor to Avions Marcel Dassault-Breguet Aviation, Vaucresson, France

Filed Apr. 16, 1982, Ser. No. 369,089
Claims priority, application France, Apr. 17, 1981, 81 07770
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—683 **6 Claims**



1. A process for automatically purifying the active liquid in a closed loop hydraulic control circuit by removing contaminent ions and corrosive products produced therein during operation of the closed loop hydraulic control circuit, said process comprising the steps of

providing a band of solid state trap material which is insoluble in said active liquid and is chemically reactive with the contaminent ions and corrosive products in said active liquid so as to chemically fix them on the surface thereof,

providing an opening in said closed loop hydraulic control circuit,

moving said band of solid state trap material through said opening and into said closed loop hydraulic control circuit so as to become immersed in the active liquid therein,

closing said opening, and

causing said active liquid to flow in said closed loop hydrau-

lic control circuit and past said band of solid state trap material, such that said contaminent ions and corrosive products in the active liquid flowing past said band of solid state trap material will become chemically fixed on the surface thereof.

4,442,009

BOILER WATER TREATMENT

Richard P. O'Leary, Wayne, and David W. Reichgott, Richboro, both of Pa., assignors to Betz Entec, Inc., Horsham, Pa.

Filed Jun. 7, 1982, Ser. No. 385,751
Int. Cl.³ C02F *5/10*
U.S. Cl. 210—697 **9 Claims**

1. A method for controlling scale which would otherwise be formed from water-soluble calcium, magnesium and iron impurities contained in boiler water which would provide calcium, magnesium and iron ions, which method comprises adding to said water:

(i) a chelant selected from the group of ethylene diamine tetraacetic acid and the water soluble salts thereof, in an amount which is substoichiometric to that amount required to react with said ions present in the water, and is at least about 0.5 parts per million for each part of calcium and magnesium (all expressed as calcium carbonate) contained in the water;

(ii) a watr soluble phosphate salt which will provide orthophosphate ions in said water in an amount which is less than a 1:1 mole ratio of phosphate to calcium, but which is sufficient to react with all the calcium ions provided by said impurities that are not complexed by the chelant; and

(iii) a water soluble polymethacrylic acid or water soluble salt thereof in an amount sufficient to disperse any particles formed by the reaction of the calcium ions with the phosphate ions and any other particulate matter formed by the reactions of the magnesium and iron ions.

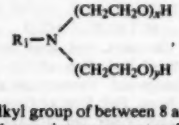
4,442,010

POLYALKOXYLATED AMINES AS DEWATERING AIDS FOR FELDSPATHIC MINERALS

Joseph L. Mehaffey, Brookfield, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Nov. 12, 1982, Ser. No. 440,888
Int. Cl.³ B01D *37/02*; C02F *1/56*
U.S. Cl. 210—729 **6 Claims**

1. A process for the concentration and dewatering of an aqueous suspension of feldspathic minerals, comprising: adding to said suspension a filter aid in an amount between 0.05 and 0.5 pounds per ton of dry solids contained in said aqueous suspension, said filter aid having the general formula:



wherein R_1 is an alkyl group of between 8 and 18 carbon atoms and wherein x and y are integers greater than 0 whose sum is between 2 and 15; and then filtering said aqueous suspension.

4,442,011

DRILLING MUD VISCOSIFICATION AGENTS BASED ON SULFONATED IONOMERS

Warren A. Thaler, Aberdeen, N.J.; Thad O. Walker, Humble, Tex.; Robert D. Lundberg, Bridgewater, and Joseph Wagensommer, Westfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 21, 1981, Ser. No. 332,770
Int. Cl.³ C09K *7/06*
U.S. Cl. 252—8.5 M **9 Claims**

1. An oil based drilling mud which comprises:

(a) a liquid hydrocarbon;

(b) about 1 to about 10 parts by weight of water per 100 parts by weight of the liquid hydrocarbon;

(c) about 20 to about 50 lb/bbl of at least one emulsifier;

(d) weighting material of sufficient quantity necessary to achieve the desired density; and

(e) about 0.25 to about 2 lb/bbl of a neutralized sulfonated ethylene/propylene/5-phenyl-2-norbornene terpolymer, said neutralized sulfonated polymer having about 5 to about 30 meq. of sulfonate groups per 100 grams of the neutralized sulfonated polymer, said terpolymer having about 0.5 to about 20 wt.% of said 5-phenyl-2-norbornene and said terpolymer having a number average molecular weight of about 5,000 to 300,000.

4,442,012

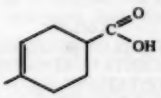
USE OF 4-METHYL-3-CYCLOHEXENE-1-CARBOXYLIC ACID FOR AUGMENTING OR ENHANCING THE AROMA OF FABRIC SOFTENER COMPOSITIONS OR DRIER-ADDED ARTICLES

Nicholas Calderone, Laurel Hollow, N.Y.; Hugh Watkins, Lincroft, and Takao Yoshida, West Long Branch, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 316,238, Oct. 29, 1981, which is a division of Ser. No. 299,211, Sep. 3, 1981. This application Jun. 24, 1982, Ser. No. 391,589
Int. Cl.³ D06M *13/20*
U.S. Cl. 252—8.6 **2 Claims**

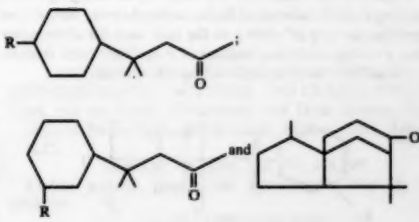
1. A process for augmenting or enhancing the aroma of a fabric softener composition or drier-added fabric softener article comprising the step of adding to a fabric softener composition or drier-added fabric softener article component an aroma augmenting on enhancing quantity of a mixture of chemical compounds comprising:

A. the compound having the structure:



and

B. at least one compound selected from the group consisting of compounds having the structures:



wherein R is selected from the group consisting of t-butyl and t-amyl and R′ is selected from the group consisting of methyl, ethyl, propyl, butyl, allyl and methallyl.

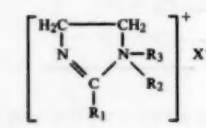
4,442,013
CONCENTRATED FABRIC SOFTENING COMPOSITIONS

Marie-Helene Fraikin, Herstal, and Alan Dillarstone, Rocourt, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,726
Int. Cl.³ D06M *13/46*
U.S. Cl. 252—8.8 **6 Claims**

1. A stable, aqueous, concentrated fabric softening composition consisting essentially of water and about

(a) 8 to 20% by weight of an imidazolinium softener compound of the formula:



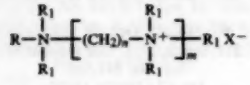
wherein

R_1 is C_8 to C_{30} aliphatic radical;

R_2 and R_3 are independently selected from R_1 radicals, or C_1 to C_4 alkyl or substituted C_1 to C_4 alkyl and

X is a water-solubilizing anion, and

(b) from about 0.5 to about 5% by weight of a polyquaternary compound of the formula:



wherein

R is C_{10} to C_{30} aliphatic radical;

R_1's are independently hydrogen, C_1 to C_4 alkyl or hydroxyalkyl;

n is an integer from 2 to 6;

m is an integer from 1 to 5; and

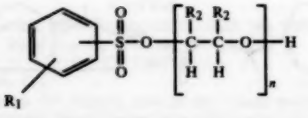
X is a water-solubilizing anion, the weight ratio of (A) to (B) ranging from 40:1 to 5:1.

4,442,014
USE OF ESTERS OF SULFONIC ACIDS AS ANTI-SLUDGE AGENTS DURING THE ACIDIZING OF FORMATIONS CONTAINING SLUDGING CRUDE OILS

James R. Looney, and Lee A. McDougall, both of Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 1, 1982, Ser. No. 344,606
Int. Cl.³ E21B *43/27*
U.S. Cl. 252—8.55 C **7 Claims**

1. A method for enhancing the recovery of sludging crude oils during acid stimulation of hydrocarbon bearing formations comprising the step of adding to the acid used for stimulation at least a sludge inhibiting amount of a nonionic ester derivative of a sulfonic acid represented by the formula



wherein: R_1 represents a hydrocarbyl group containing from 6 to 22 carbon atoms; R_2 represents hydrogen, methyl, ethyl, and phenyl; and, n is an integer of from 0.5 to 100.

4,442,015
SELF-SEALING REFRIGERANT

Joseph J. Packo, 11000 Onion Creek Ct., Austin, Tex. 78747, and Donald L. Bailey, Traverse City, Mich., assignors to Joseph J. Packo, Austin, Tex.

Filed Jul. 12, 1982, Ser. No. 397,191
Claims priority, application Japan, May 31, 1982, 57-092931
Int. Cl.³ C09K *5/04*
U.S. Cl. 252—68 **15 Claims**

1. A leak sealing, leak preventing and moisture removing refrigeration fluid composition for refrigeration and air-conditioning units, comprising:

(a) a material selected from the group consisting of a refrigerant fluid which ammonia or chlorofluorocarbon, a lubricating fluid and a mixture thereof; and

(b) a liquid sealant for removing moisture from the interior of the refrigeration or air-conditioning circuit and for forming a seal at the site of a leak in such a circuit, said sealant being a liquid hydrolyzable organosilane or mixture thereof compatible with said refrigerant fluid, which does not substantially interfere with the properties of the refrigerant fluid, which exists as a liquid both in the liquid portion of the circuit and the gaseous portion of the circuit, and which is substantially inert to the material from which the circuit is made, said organosilane sealant being selected from silanes and mixtures of silanes having at least two silicon-bonded hydrolyzable substituents selected from the group consisting of alkylamino-, dialkylamino-, mercapto-, acyloxy-, alkoxy-, amido-, aminoxy-, and oximo-groups; low molecular weight, low viscosity silicone polymers having at least 2 silicon-bonded hydrolyzable substituents selected from the group consisting of alkylamino-, dialkylamino-, mercapto-, acyloxy-, alkoxy-, amido-, aminoxy-, oximo-, disilazanyl- and disilthianyl groups; low molecular weight, low viscosity silicon-substituted organic polymers having at least two silicon-bonded hydrolyzable substituents selected from the group consisting of alkylamino-, dialkylamino-, mercapto-, acyloxy-, alkoxy-, amido-, aminoxy-, and oximo-groups; mixtures of said silanes and said silicone polymers; and mixtures of said silanes and said silicon-substituted organic polymers.

4,442,016
INCREASING THE CYCLE STABILITY OF A SODIUM SULFATE HEAT EXCHANGE MEDIUM BY ADDING SULFURIC ACID

Friedrich Lindner, Stuttgart, and Kurt Scheunemann, Lahr-Mietersheim, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt für Luft- und Raumfahrt E.V., Bonn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 275,215, Jun. 19, 1981, abandoned. This application Feb. 25, 1983, Ser. No. 469,686
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024125
Int. Cl.³ C09K *5/00*
U.S. Cl. 252—70 **3 Claims**

1. A method for increasing the cycle stability of a latent heat accumulator medium consisting essentially of a concentrated or saturated salt melt of sodium sulfate, which method comprises adding sulfuric acid to the latent heat accumulator medium in an amount of from 0.5 to 3% by weight, based on the weight of said latent heat accumulator medium, thereby to lower the pH value of the latent heat accumulator medium without precipitating any impurities included therein and without causing appreciable supercooling of said latent heat accumulator medium.

4,442,017

ADDITIVE BLENDS FOR POLYMERIC MATERIALS

Morris Blumberg, Irvington, N.Y., and Chester C. Swasey, Demarest, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 157,687, Jun. 9, 1980, abandoned, which is a division of Ser. No. 916,733, Jun. 19, 1978, Pat. No. 4,238,384. This application Aug. 24, 1982, Ser. No. 411,100

Int. Cl.³ C09K *11/06*

U.S. Cl. 252—301.21 14 Claims

1. A composition which is a solid uniform blend consisting of (a) one or more additives for organic polymers, each additive independently being normally solid at room temperature and being an anti-oxidant, stabilizer, lubricant, flameproofing agent, slip agent, anti-blocking agent anti-static agent and (b) a compound which gives a detectable response to irradiation in the presence of said additive(s), said additive(s) and said irradiation-responsive compound being in intimate cohesive contact with one another.

4,442,018

STABILIZED AQUEOUS FOAM SYSTEMS AND CONCENTRATE AND METHOD FOR MAKING THEM

Peter B. Rand, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 1, 1982, Ser. No. 438,126

Int. Cl.³ B01J *13/00;* A62D *1/08;* C09K *3/00;* A61K *9/00*

U.S. Cl. 252—307 19 Claims

1. A concentrate composition useful for producing a stable high expansion aqueous foam, comprising on a weight basis: an acrylic acid polymer, about 2–3%, dodecyl alcohol, tetradecanol or hexadecanol, about 2–3%; pentanol or butanol, about 10%; a sodium lauryl sulfate or alpha-olefin sulfonate, about 8%; and water, 70–80%.

4,442,019

ELECTROORDERED DIPOLE SUSPENSION

Alvin M. Marks, Bigelow Rd., Athol, Mass. 01331

Continuation-in-part of Ser. No. 909,944, May 26, 1978, abandoned. This application Jan. 5, 1981, Ser. No. 222,377

Int. Cl.³ B01J *13/00;* G02F *1/01;* G05D *25/00*

U.S. Cl. 252—309 31 Claims

1. An electrodichroic composition of matter comprising a fluid suspension of asymmetric electrically charged conductive particles in an insulating surfactant fluid, said electrically charged particles producing an electrostatic field mutually repelling said particles, said fluid suspension having a resistivity exceeding 10^{10} ohm-cm, said fluid suspension having a layer thickness of 3–50 μm, said fluid suspension layer having a particle concentration such that the ratio of random optical density to thickness in micrometers is between 0.08 and 0.8, a constant amplitude alternating electric voltage, said voltage being applied across said layer, said voltage being such as to produce an electrodichroic ratio of 6 to 40, where said particles form an electroordered array without particle coagulation in said fluid.

4,442,020

CATALYTIC STEAM REFORMING OF HYDROCARBONS

Andrija Fuderer, Antwerpen, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 114,566, Jan. 23, 1980, Pat. No. 4,337,170. This application Jun. 3, 1982, Ser. No. 384,581

The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.

Int. Cl.³ C01B *3/38*

U.S. Cl. 252—373 9 Claims

1. An improved process for the catalytic steam reforming of fluid hydrocarbons comprising:

(a) catalytically reacting a major portion of a fluid hydrocarbon feed stream with steam in catalyst-containing reformer tubes positioned within a first primary reforming zone maintained at an elevated temperature by radiant heat transfer and/or by contact with combustion gases, the hot reformer tube effluent comprising a first primary reformed gas mixture;

(b) passing said first reformed gas mixture from said first primary reforming zone to a secondary reforming zone, for the catalytic reaction therein of unconverted hydrocarbons present in the first primary reformed gas mixture with oxygen or air, the hot effluent from said zone comprising a secondary reformed gas mixture;

(c) catalytically reacting the remaining portion of said hydrocarbon feed stream with steam at an elevated temperature in a second primary reforming zone having catalyst-containing reformer tubes positioned therein; the hot effluent from said tubes comprising a second primary reformed gas mixture;

(d) passing said secondary reformed gas mixture to the second primary reforming zone for combining with said second primary reformed gas mixture at the hot discharge end of the reformer tubes of said second primary reforming zone, thus forming a hot combined reformer gas stream within said second primary reforming zone at the hot discharge end of the reformer tubes therein;

(e) passing the hot combined reformer gas formed within said second primary reforming zone countercurrently on the shell side of said second primary reaction zone, thereby supplying heat to maintain said second primary reforming zone at an elevated temperature; and

(f) withdrawing the thus-partially cooled combined reformer effluent stream, comprising a combination of said primary and secondary reformed gas mixtures, from said second primary reaction zone,

whereby the desired overall steam reforming is accomplished at a substantial reduction in hydrocarbon fuel consumption.

4,442,021

METHOD OF PROTECTING REINFORCING BARS, PRE-STRESSING CABLES AND SIMILAR ARTICLES INSIDE OF STRUCTURES

Theodor Bürge, Geroldswil, and Gustav Bracher, Rifferswil, both of Switzerland, assignors to Sika AG, vorm. Kaspar Winkler & Co., Zurich, Switzerland

Filed Jul. 8, 1982, Ser. No. 396,152

Claims priority, application Switzerland, Jul. 20, 1981, 4750/81

Int. Cl.³ C23F *11/18, 11/10*

U.S. Cl. 252—389 R 13 Claims

1. A method of protecting reinforcing bars, prestressing cables and similar articles inside of structures against corrosion, comprising the coating or covering of the reinforcing bars or prestressing cables, or similar, by an aqueous suspension of 10–99.99% hydraulic binding agents or mixtures thereof with latent hydraulic additives and 0.01–10% corrosion inhibitors.

4,442,022

PHOTOPOLYMERIZABLE COMPOSITION, PHOTOINITIATOR MIXTURE AND CURING PROCESS

Tjerk van der Hauw, Diepenveen, and Hans Jaspers, Putten, both of Netherlands, assignors to Akzona, Inc., Asheville, N.C.

Filed Oct. 28, 1981, Ser. No. 315,799

Claims priority, application Netherlands, Nov. 5, 1980, 8006035

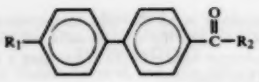
Int. Cl.³ C08F *2/46, 4/00*

U.S. Cl. 502—150 3 Claims

1. A photoinitiator mixture comprising:

a. benzil, fluorenone, or mixtures thereof;

b. a biphenylyl ketone of the formula:



wherein:

R_1=hydrogen, an alkyl group having 1–8 carbon atoms, an alkoxy group having 1–10 carbon atoms, an alkyl carbonyl group having 2–12 carbon atoms or a halogen atom; and

R_2=an alkyl group having 1–12 carbon atoms, phenyl, naphthyl, furyl or thiophenyl, which groups may be substituted or not, and

wherein the molar ratio of said biphenylyl ketone to said benzil, fluorenone, or mixtures thereof is between 0.25 and 9.

4,442,023

HYDROTREATING HYDROCARBON FEEDSTOCKS

Roland H. Heck, Pennington; Edward J. Rosinski, Pedricktown, and Stuart S. Shih, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 220,554, Dec. 29, 1980, abandoned. This application Feb. 17, 1983, Ser. No. 467,573

Int. Cl.³ B01J *27/06*

U.S. Cl. 502—222 **13 Claims**

1. In a hydrotreating catalyst consisting essentially of about 10 wt. % to about 20 wt. % of at least one Group VIA metal, metal oxide or metal sulfide and about 3.5 wt. % to about 6.5 wt. % of at least one Group VIIIA metal, metal oxide or metal sulfide deposited on an inorganic refractory oxide, the improvement wherein said catalyst further consists essentially of about 0.1% to about 7% by weight of a halogenated metal compound selected from the group consisting of halogenated metal compound of Groups IB, IIB, IIIB, titanium and tin.

4,442,024

CATALYST AND METHOD OF MAKING THE SAME

John M. Crone, Jr., Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 9, 1982, Ser. No. 346,773

Int. Cl.³ B01J *23/42*

U.S. Cl. 502—334 **11 Claims**

1. A method of forming a catalytic article consisting essentially of the steps of contacting substrate and aluminum metal with a coating solution comprising an alkali aluminate and an alkali hydroxide for a period of time sufficient to form a film of hydrated alumina on said substrate; separating said film coated substrate from said coating solution; forming a slurry of a catalytic material, a calcined alumina material and a liquid carrier; contacting said film of alumina with said slurry; and then calcining said slurry coated alumina film and substrate.

4,442,025

PERFUME COMPOSITIONS AND PERFUMED ARTICLES CONTAINING ESTERS OF SUBSTITUTED BICYCLO [2.2.1]HEPTANE- AND HEPTENE-CARBOXYLIC ACIDS AS PERFUME BASE

Harmannus Boelens; Antonius J. A. van der Weerdt, and Theodorus G. M. Hesp, all of Huizen, Netherlands, assignors to Naarden International, N.V., Naarden-Bussum, Netherlands

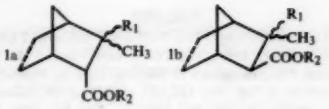
Filed May 27, 1981, Ser. No. 267,644

Claims priority, application Netherlands, May 28, 1980, 8003068

Int. Cl.³ A61K *7/46*; C11B *9/00*

U.S. Cl. 252—522 R **8 Claims**

1. A perfume composition comprising one or more esters of methyl substituted bicyclo[2.2.1]heptane- and/or heptene-carboxylic acid having the following formulae:



ENDO EXO

wherein the dotted line is a single or double bond; R_1 is selected from a group consisting of CH_3 and H; and R_2 is selected from a group consisting of alkyl and alkenyl having 1–4 carbon atoms.

4,442,026

Patent Not Issued For This Number

4,442,027

ELECTRICAL INSULATING OIL COMPOSITION

Atsushi Sato, Tokyo; Naoya Takahashi, Yokohama; Keiji Endo, Yokohama, and Hitoshi Yanagishita, Yokohama, all of Japan, assignors to Nippon Petrochemicals Company Ltd., Tokyo, Japan

Continuation of Ser. No. 300,503, Sep. 9, 1981, abandoned. This application Jul. 8, 1983, Ser. No. 511,728

Claims priority, application Japan, Sep. 11, 1980, 55-126489

Int. Cl.³ H01B *3/22*

U.S. Cl. 252—574 **4 Claims**

1. An electrical insulating oil composition which is resistant to deterioration caused by contact with lead and lead alloys consisting essentially of aromatic hydrocarbons having two to three aromatic nuclei and sulfur compounds in an amount sufficient to provide 5 to 300 ppm as sulfur, said sulfur compounds obtained by treating in the presence of an acid catalyst a liquid phase hydrocarbon by-product fraction derived from the thermal cracking of petroleum hydrocarbons at a temperature of at least 700° C. and principally composed of components with a boiling range of between about 75° C. and about 198° C., said acid catalyst treated hydrocarbon by-product fraction having a boiling range of between 265° C. and 360° C. and combined with said aromatic hydrocarbons whereby said sulfur concentration is adjusted to 5 to 300 ppm as sulfur.

4,442,028

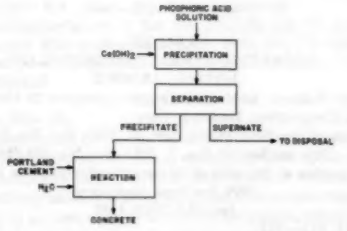
METHOD FOR INCORPORATING RADIOACTIVE PHOSPHORIC ACID SOLUTIONS IN CONCRETE

Gary A. Wolf, Kennewick, Wash.; Jeffrey W. Smith, Lancaster, Ohio, and Nathan C. Ihle, Walla Walla, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 8, 1982, Ser. No. 396,192

Int. Cl.³ G21F *9/10, 9/11*

U.S. Cl. 252—628 **5 Claims**



1. A method for incorporating radioactive phosphoric acid solutions in concrete comprising:

(a) first neutralizing a phosphoric acid solution containing Cobalt-60 with $Ca(OH)_2$ and thereby forming a precipi-

tate, said precipitate having the formula $Ca_{10}(PO_4)_6(OH)_2$ and the crystal structure of hydroxyapatite, and then

(b) mixing said precipitate with portland cement and thereby forming concrete.

4,442,029

PROCESS FOR THE PREPARATION OF ACID AMIDES AND APPLICATION OF THE PROCESS

Dieter Marquarding, Darmstädter Strasse 11, 800 Munich 50, and Helmut Aigner, Barerstrasse 52, 8000 Munich 40, both of Fed. Rep. of Germany

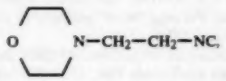
Continuation of Ser. No. 198,251, Oct. 17, 1980, abandoned. This application Jan. 25, 1983, Ser. No. 460,881

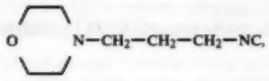
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1979, 2942606

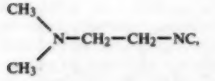
Int. Cl.³ C07C *102/04*

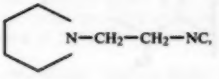
U.S. Cl. 260—112.5 R **1 Claim**

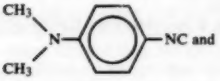
1. In a process for the preparation of acid amides by reacting a carboxylic acid and an amine in the presence of an isonitrile, the improvement consisting of using as said isonitrile a compound selected from the group consisting of:

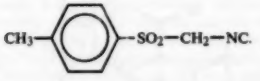












4,442,030

PROCESS FOR PREPARING CARBOXYALKYL DIPEPTIDES

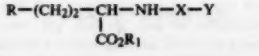
William J. Greenlee, Teaneck, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 385,745, Jun. 7, 1982, abandoned. This application Jan. 31, 1983, Ser. No. 462,727

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **10 Claims**

1. A process for preparing carboxyalkyl dipeptides having the formula:



I

wherein

R is

aryl;

substituted aryl wherein the substituent can be loweralkyl, loweralkoxy, or halo;

heteroaryl which can optionally include an O or N atom;

substituted heteroaryl wherein the substituent(s) on the aryl and heteroaryl groups is (are) halo, dihalo, loweralkyl, hydroxy, loweralkoxy, acylamino, haloloweralkyl;

R_1 is loweralkyl of 1 to 4 carbon atoms;

X is

alanine;

glycine;

isoleucine;

leucine;

lysine;

phenylalanine;

valine;

Y is

alanine;

glycine;

isoleucine;

leucine;

lysine;

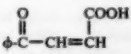
phenylalanine;

proline;

valine; and,

the pharmaceutically acceptable salts thereof; which process comprises:

reacting a compound having the formula:



II

with a dipeptide to obtain a dicarboxy dipeptide; hydrogenating said dicarboxy dipeptide in an acidic medium in an alcohol solvent to afford, after concomittant esterification, a dicarboalkoxy dipeptide as a mixture of diasteromers; and, separating said diastereomeric mixture to produce said Formula I compounds.

4,442,031

IMMUNOPOTENTIATING PEPTIDES

Arthur M. Felix, West Caldwell, N.J.; Hideo Ishitsuka, Yokohama, Japan; Johannes A. Meienhofer, Upper Montclair, N.J., and Yumiko Ohta, Zushi, Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 311,569, Oct. 15, 1981, which is a continuation-in-part of Ser. No. 282,571, Jul. 13, 1981, abandoned. This application Apr. 5, 1983, Ser. No. 482,347

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **3 Claims**

1. A compound of the formula

H-Lys-X-Glu-Val-Val-Glu-OH

wherein X is -Lys- or -Ser-, or a pharmaceutically acceptable salt thereof.

4,442,032

ISOTHIOCYANATO-AZOBENZENE-SULFONIC, ARSONIC AND SUBSTITUTED-GLUTAMIC ACID HAPTENS

Robin G. Simmonds, Wokingham, England, assignor to Lilly Industries Limited, London, England

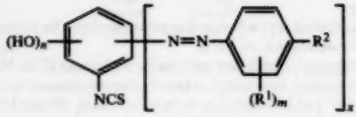
Filed Nov. 27, 1981, Ser. No. 325,513

Claims priority, application United Kingdom, Dec. 4, 1980, 8038910

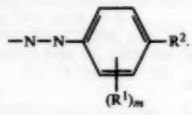
Int. Cl.³ C07C *107/06, 113/04*; C09B *29/12, 33/044*

U.S. Cl. 260—149 **3 Claims**

1. A compound of formula



in which n is 1 or 2, R^1 is C_{1-4} alkyl, C_{1-4} alkoxy, nitro, amino, halo or hydroxy, m is 0, 1 or 2, R^2 is an immunogenic determinant and x is 1 or 2, provided that when n is 1, x is 1 or 2 and there is one diazo moiety at the 3-position or two diazo moieties at the 3- and 5-positions, with respect to the isothiocyanate group, and the hydroxy group is at the 4-position; and provided that when n is 2, x is 1 and the diazo moiety is at the 4-position and the hydroxy groups are at the 3- and 5-positions, wherein the term diazo moiety represents



4,442,033

AZO DYESTUFF FOR USE AS A CHROMOGEN IN DETECTING LEUKOCYTES

Dieter Berger, Viernheim; Franz Braun, Rimbach; Günter Frey, Ludwigshafen; Werner Güthlein, Mannheim-Neckarau, and Manfred Kuhr, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

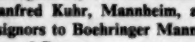
Division of Ser. No. 63,211, Aug. 2, 1979, Pat. No. 4,296,202. This application Jun. 8, 1981, Ser. No. 271,342

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1978, 2836644

Int. Cl.³ C09B *29/036, 29/042, 29/15;* **C12Q** *1/29*

U.S. Cl. 260—158 **25 Claims**

1. Azo dyestuff of the formula



wherein

A is a five- or six membered heterocyclic radical of up to 2 hetero ring atoms selected from nitrogen, sulfur and oxygen, and wherein the heterocyclic ring is unsubstituted or substituted with at least one member of the group selected from F, Cl, Br, lower alkyl with 1 to 5 carbon atoms and lower alkoxy with 1 to 5 carbon atoms; or

A is phenyl substituted by one to three radicals selected from lower alkyl with 1 to 5 carbon atoms, lower alkoxy with 1 to 5 carbon atoms, nitro, sulphonato and benzoylamino;

B is substituted once or twice, or unsubstituted benzene, naphthalene or quinoline, wherein the substituents are selected from the group consisting of sulphonato, lower alkoxy with 1 to 5 carbon atoms and lower alkoxypolyethyleneoxy containing an alkoxy group with 1 to 5 carbon atoms and 1 to 5 ethyleneoxy groups;

R is an amino acid or di-to pentapeptide having an NH_2 protective group, said amino acid being a naturally occurring L-alpha-amino acid attached to substituent B through a terminal carboxyl group; and

n is 1 or 2.

4,442,034

PROCESS FOR PRODUCING CORN OIL

Hirohisa Suzuki, and Hironiro Takahashi, both of Kamakura, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,729

Claims priority, application Japan, Apr. 17, 1980, 55-50999; Apr. 17, 1980, 55-51000

Int. Cl.³ C11B *9/00, 1/10*

U.S. Cl. 260—236.6 **6 Claims**

1. A process for producing corn oil, which comprises: (a) obtaining germ by the dry milling of maize; (b) separating the higher oil-content germ having an oil content of not less than 22% by weight from the lower oil-content germ; (c) pelletizing said lower oil-content germ; (d) mixing said pelletized lower oil-content germ with said higher oil-content germ; (e) heating and flaking said mixed germ fractions, thereby obtaining a flaked product, wherein the temperature of the heating process is in the range of from 60° C. to 90° C.; and (f) contacting said flaked product with an organic solvent to extract corn oil therefrom.

4,442,035

ACYCLIC AMINE EPOXIDE PROCESS

Clifford E. Sacks, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

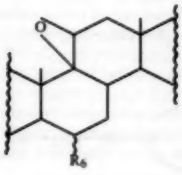
Continuation-in-part of Ser. No. 431,548, Sep. 30, 1982, abandoned. This application Oct. 25, 1982, Ser. No. 436,219

Int. Cl.³ C07J *71/00*

U.S. Cl. 260—239.55 R **33 Claims**

1. A process for the preparation of an epoxide of the formula

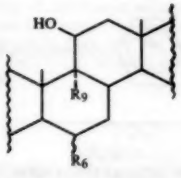
(II)



which comprises

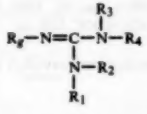
(I) contacting a 9α-substituted 11β-hydroxy steroid of the formula

(I)

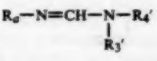


with an acyclic amine selected from the group consisting of compounds of the formula

(III)



(IV)



and

(2) isolating the epoxide (II) where

R_a is alkyl of one through 7 carbon atoms, cycloalkyl of 5 through 7 carbon atoms, phenyl substituted with one through 3—R, —OR_{50} or —$N(T_{50})_2$ where with the amine the R_{50}'s can be the same or different and can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine;

R_g is R_a and a hydrogen atom, or phenyl;

R_1 is alkyl of one through 7 carbon atoms, cycloalkyl of 5 through 7 carbon atoms, phenyl substituted with zero through 3—R, —OR_{50} or —$N(R_{50})_2$ where with the amine the R_{50}'s can be the same or different and can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine with the proviso that R_1 and R_2 combined cannot have more than 14 carbon atoms; R_1 and R_2 can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine;

R_2 is alkyl of one through 7 carbon atoms, cycloalkyl of 5 through 7 carbon atoms, phenyl substituted with zero through 3—R, —OR_{50} or —$N(R_{50})_2$ where with the amine the R_{50}'s can be the same or different and can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrroiidine and morpholine with the proviso that R_1 and R_2 combined cannot have more than 14 carbon atoms; R_1 and R_2 can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine;

R_3 is alkyl of one through 7 carbon atoms, cycloalkyl of 5 through 7 carbon atoms, phenyl substituted with zero through 3—R, —OR_{50} or —$N(R_{50})_2$ where with the amine the R_{50}'s can be the same or different and can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine with the proviso that R_3 and R_4 combined cannot have more than 14 carbon atoms; R_3 and R_4 can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine;

R_3' is alkyl of one through 7 carbon atoms, cycloalkyl of 5 through 7 carbon atoms, phenyl substituted with one through 3—R, —$OR_{50})_2$ where with the amine the R_{50}'s can be the same or different and can be combined to form a secondary amine selected from the group consisting of piperidine, pyrrolidine or morpholine, with the proviso that R_3' and R_4' combined cannot have more than 14 carbon atoms; R_3' and R_4' combined cannot have more than 14 carbon atoms; R_3' and R_4' can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine;

R_4 is alkyl of one thru 7 carbon atoms, cycloalkyl of 5 thru 7 carbon atoms, phenyl substituted with zero thru 3—R, —OR_{50} or —$N(R_{50})_2$ where with the amine the R_{50}'s can be the same or different and can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine with the proviso that R_3 and R_4 combined cannot have more than 14 carbon atoms; R_3 and R_4 can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine;

R_4' is alkyl of one thru 7 carbon atoms, cycloalkyl of 5 thru 7 carbon atoms, phenyl substituted with one thru 3—R, —OR_{50} or —$N(R_{50})_2$ where with the amine the R_{50}'s can be the same or different and can be combined to form a secondary amine selected from the group consisting of piperidine, pyrrolidine or morpholine, with the proviso that R_3' and R_4' combined cannot have more than 14 carbon atoms; R_3' and R_4' can be combined to form a cyclic secondary amine selected from the group consisting of piperidine, pyrrolidine and morpholine;

R_6 is a hydrogen or fluorine atom or methyl group;

R_9 is a chlorine, bromine or iodine atom or hydroxyl group as the tosylate, mesylate, or triflate ester;

R_{16} is a hydrogen atom, hydroxyl, acyloxy where the acyl group contains 2 thru 6 carbon atoms, or methyl group with the proviso that when R_{16} is a hydroxyl group and when R_{17} is a hydrogen atom the hydroxyl groups at C_{16} and C_{17} can be in the form of an acetonide;

R_{17} is a hydrogen atom or a —$COR_{17\alpha}$ group with the proviso that when R_{17} is a hydrogen atom and R_{16} is a hydroxyl group the hydroxyl groups at C_{16} and C_{17} can be in the form of an acetonide;

$R_{17\alpha}$ is an alkyl of one thru 6 carbon atoms or phenyl;

R_{21} is alkyl of one thru 6 carbon atoms or phenyl, or phenyl substituted with p-nitro or m-methoxy groups;

R_{50} is a hydrogen atom or alkyl of 1 thru 3 carbon atoms;

~ indicates the attached atom or group can be in the alpha or beta configuration; and

=== is a single or double bond.

4,442,036

PROCESS FOR OXIDIZING PHENOL TO BENZOQUINONE

Chao-Yang Hsu, Media, and James E. Lyons, Wallingford, both of Pa., assignors to Sun Tech, Inc., Philadelphia, Pa.

Filed Feb. 28, 1983, Ser. No. 470,694

Int. Cl.³ C07C 49/64

U.S. Cl. 260—396 R **10 Claims**

1. In the process of oxidizing phenol to benzoquinone in a polar organic solvent with a bivalent copper catalyst, the improvement which comprises obtaining increased selectivity and/or conversion by promoting the catalyst with a vicinal dialkoxy alkane or cycloalkane.

4,442,037

WATER-SOLUBLE CHOLESTEROL DERIVATIVE

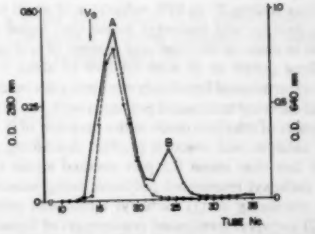
Yoshio Arakawa, 10-18, Ezakacho 1-chome, Suita-shi; Atsuyuki Takanabe, 29-19, Nagao-Higashicho 2-chome; Yahiro Uemura, 5-18, Mitsuyacho, both of Hirakata-shi; Satoshi Funakoshi, 16-5, Aoyama 1-chome, Katano-shi, and Tadakazu Suyama, 3-7, Tanabecho, Matsuigaoka 4-chome, Tsuzuki-gun, Kyoto, all of Japan

PCT No. PCT/JP81/00056, 371 Date Sep. 28, 1982, 102(e) Date Sep. 28, 1982, PCT Pub. No. WO82/03175, PCT Pub. Date Sep. 30, 1982

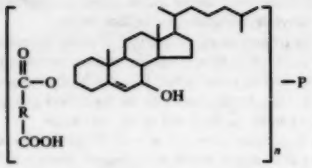
PCT Filed Mar. 13, 1981, Ser. No. 432,938

Int. Cl.³ C07J 9/00

U.S. Cl. 260—397.2 **10 Claims**



1. A complex of albumin with an organic dibasic acid half ester of 7-hydroxycholesterol, said complex being represented by the formula



wherein R is phenylene or $(CH_2)_m$, of which m indicates 0 or an integer of 1–5, P is albumin residue, and n is a number of 20–200 indicating the number of moles of the steroid, shown in the bracket, binding to mole of albumin.

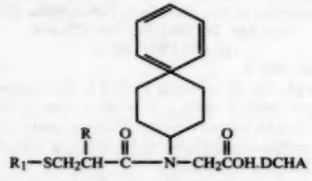
4,442,038

CONVERTING ENZYME INHIBITORS

James R. Skuster, Norwich, N.Y., assignor to Norwich Eaton Pharmaceuticals, Inc.

Filed Sep. 17, 1982, Ser. No. 419,152
Int. Cl.³ C07C *153/11*
U.S. Cl. 260—455 R **5 Claims**

1. A compound of the formula:



wherein R is H or lower alkyl and DCHA is dicyclohexylamine or nil and R_1 is hydrogen or benzoyl.

3. The compound trans-(S)-(−)-N-(3-benzoylthio-2-methyl-1-oxopropyl)-N-(4-phenylcyclohexyl)glycine.

4,442,039

PROCESS FOR TREATING HYDROXYL TERMINATED LIQUID POLYMERS

Walter T. Murphy, Cuyahoga Falls, and Clifford D. Gulley, Jr., Medina, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 154,671, May 30, 1980, abandoned. This application May 6, 1982, Ser. No. 375,414
Int. Cl.³ C07C *121/30, 67/48*
U.S. Cl. 260—465.4 **9 Claims**

1. A process for improving the reactivity of hydroxyl terminated liquid polymers with organic polyisocyanates which comprises adding 20 to 96% sulfuric acid or 20 to 85% phosphoric acid to said hydroxyl terminated liquid polymers in amount to increase the total acid number of said polymer by at least three points to an acid number of about 6 to 12, said hydroxyl terminated liquid polymers being the reaction product of liquid carboxyl terminated polymers with 3 to 10 parts per 100 of polymer of ethylene oxide in the presence of 0.1 to 0.5 of an amine catalyst, said reaction product containing greater than 0.01 to less than about 0.5 part residual amine catalyst, said liquid carboxyl terminated polymers being selected from the group consisting of (1) carboxyl terminated poly(butadiene-1,3), (2) carboxyl terminated copolymers of butadiene-1,3 and acrylonitrile containing more than 50 weight percent butadiene with the remainder being acrylonitrile, and (3) carboxyl terminated poly(alkyl acrylate) polymers of alkyl acrylates wherein the alkyl groups contains 1 to 18 carbon atoms.

4,442,040

POLYMERIC RHODIUM, IRIDIUM AND RUTHENIUM PHOSPHINE COMPLEX COMPOUNDS, PROCESSES FOR THEIR PRODUCTION AND USE

Peter Panster, and Peter Kleinschmit, both of Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

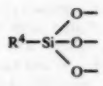
Filed Jul. 16, 1981, Ser. No. 283,868
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 3029599
Int. Cl.³ C07F *15/00*
U.S. Cl. 260—429 R **24 Claims**

1. A polymeric complex compound of a noble metal selected from the group consisting of rhodium, iridium and ruthenium, having a silica-like structure, wherein at least one phosphine of the formula:

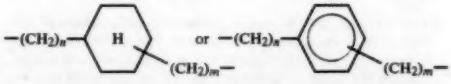
(1)

is coordinately bound to the noble metal atom selected from the group consisting of rhodium, iridium and ruthenium; an atomic ratio of noble metal to phosphorus being $1:1–1:10^6$; any free coordination positions on said noble metal atom being occupied by other electron pair donors, and any required charge equalization being furnished by an inorganic or organic anion;

wherein R^1 is a group of the formula:

 (2)

in which R^4 is a straight-chain or branched alkylene with 1 to 10 carbons, cycloalkylene with 5 to 8 carbons, or a group of the following formula:



in which n is from 1 to 6, and corresponds to the number of methylene groups situated on phosphorus, m can be a number from 0 through 6, the ring hydrogen atoms can be partially or completely substituted by halogen, methyl or ethyl, and the free valences on the oxygen atoms are saturated either by silicon atoms of further units of formula (2) or by silicon, titanium or aluminum bridging atoms,

R^2 and R^3 may be R^1, alkyl or alkoxy containing 1 to 6 carbons, phenyl or phenoxy groups substituted with alkyl or alkoxy of 1 to 6 carbons.

4,442,041

METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

N. Subramanian, Hercules, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 393,573, Jun. 30, 1982. This application May 31, 1983, Ser. No. 499,588
Int. Cl.³ C07F *9/38*
U.S. Cl. 260—502.5 F **6 Claims**

1. A method for the preparation of N-phosphonomethylglycine which comprises the steps of:

(1) reacting N-(diethylphosphonomethyl)iminobisethanol in an oxygen free atmosphere with an alkali metal hydroxide

selected from the group consisting of sodium hydroxide and potassium hydroxide, in the presence of water as solvent and a catalyst selected from the group consisting of zinc oxide and cadmium oxide at a temperature ranging from about 270° C. to about 280° C. and pressure ranging from about 800 psi to about 1500 psi, for a combination of time, temperature and pressure sufficient for the reaction to go to completion thus forming as an intermediate product N-phosphonomethylglycine trisalt and

(2) acidifying said intermediate product thus formed.

4,442,042

PROCESS OF MAKING PROPANE SULFONATES

Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,218
Int. Cl.³ C07C *143/11, 143/06, 143/38*
U.S. Cl. 260—512 R **8 Claims**

1. A method of preparing propane sulfonates from alcohols or thiols via their allyl ethers comprising conducting, under suitable conditions, a reaction in accordance with the following 2-step procedure in a single reactor without isolation of intermediates:

$$RZH+NaOH+CH_2{=}CHCH_2X \rightarrow RZCH_2CH{=}CH_2+NaX \quad (1)$$

$$RZCH_2CH{=}CH_2+NaHSO_3 \rightarrow RZCH_2CH_2CH_2SO_3Na \quad (2)$$

where R is C_1–C_{16} alkyl, alkaryl, alkyl-polyoxyethylene or alkarylpolyoxyethylene, X is halide or tosylate, Z is O or S, and where the NaOH is an approximately 50% aqueous system; and recycling to (1) a minor amount of the desired product sufficient to function as phase transfer catalyst for said reaction, whereby the yield is improved compared to the reaction conducted in the absence of recycled product.

4,442,043

OIL RECOVERY METHOD UTILIZING A DICYCLOPENTADIENE DERIVED ETHOXYSULFONATE

David R. McCoy; Robert M. Gipson, and Carter G. Naylor, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 423,415, Sep. 24, 1982. This application Jun. 27, 1983, Ser. No. 508,214
Int. Cl.³ C07C *143/02*
U.S. Cl. 260—513 R **4 Claims**

1. A composition of matter of the formula:

$$R{-}Y(CH_2CH_2O)_m(CH_2)_nSO_3X$$

wherein

R is a dicyclopentenyl moiety,

Y is a divalent moiety selected from the group consisting of oxygen and sulfur,

X is a cation selected from the group consisting of sodium, potassium and ammonium,

n is an integer of from 2 to 3,

m is an integer of from 1 to 10 with the proviso that when Y is sulfur, m is an integer of from 2 to 10.

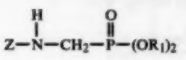
4,442,044

PROCESS FOR PREPARING MONOESTERS AND DIESTERS OF N-ALKYL SUBSTITUTED AMINO METHYL PHOSPHONIC ACID

William R. Purdum, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

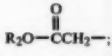
Continuation-in-part of Ser. No. 275,487, Jun. 19, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 479,246
Int. Cl.³ C07F *9/40*
U.S. Cl. 260—969 **3 Claims**

1. A process for the preparation of phosphonate compounds useful as herbicides of the formula



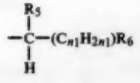
(I)

wherein Z is selected from the group consisting of



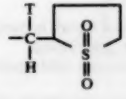
wherein R_2 is lower alkyl, lower alkoxy alkyl, halo lower alkyl or phenyl lower alkyl; lower alkynyl; lower alkyl; and $NCCH_2$-; and R_1 is selected from the group consisting of lower alkyl; lower alkoxy lower alkyl; halo lower alkyl; phenyl lower alkyl;

wherein n is an integer from 1 to 4, R_3 is selected from the group consisting of lower alkyl, lower alkoxy lower alkyl, halo lower alkyl, phenyl lower alkyl and R_4 is hydrogen or lower alkyl;

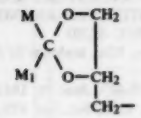


wherein R_5 is hydrogen, lower alkyl, lower alkoxy carbonyl; R_6 is halogen, lower alkoxy carbonyl, or

wherein L is lower alkyl and n_1 is an integer from 0 to 3; $(C_{n2}H_{2n2})$S-X wherein X in lower alkyl or lower alkoxy carbonyl and n_2 is an integer from 1 to 4;



wherein T is lower alkyl; and $(C_{n3}H_{2n3})$Y wherein n_3 is an integer from 0 to 4 and Y is selected from the group consisting of trihalomethyl, lower alkoxycarbonyl, furanyl, pyrolidinyl, pyranyl and



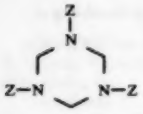
wherein M_1 and M are independently lower alkyl: said process comprising:

(a) reacting

(i) a trisubstituted phosphite of the formula $P(OR_1)_3$ wherein R_1 is as defined above, with

(ii) water, and

(iii) a compound of the formula



wherein Z is as aforedefined, to prepare a crude phosphonate composition containing said phosphonate compound, and

(b) thereafter recovering said phosphonate compound from said crude phosphonate composition.

4,442,045

APPARATUS FOR ADMIXING A GAS TO A LIQUID, IN PARTICULAR FOR ADMIXING OXYGEN TO POLLUTED WATER

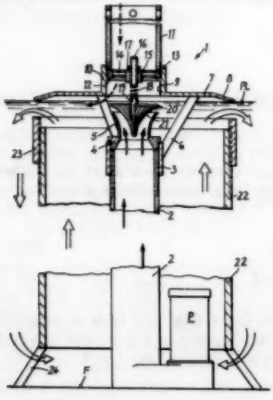
Lussoria A. Sciolla, Via Ipsitani, 80 Fordongianus (Cagliari), Italy

Filed Sep. 18, 1981, Ser. No. 303,667

Claims priority, application Italy, Sep. 26, 1980, 3521 A/80

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—36 R **3 Claims**



1. An apparatus for admixing a gas to a liquid, in particular for admixing oxygen to polluted water, comprising:

a tank containing a liquid to be oxygenated, said liquid having a free surface;

a vertical tubular column having a lower inlet and an upper outlet, said column being immersed, in use, in said liquid to be oxygenated, said upper outlet extending, in use, below the free surface of the liquid;

a pump connected to said lower inlet and adapted to draw the liquid into said tubular column through said lower inlet and to pump it upwardly to said upper outlet;

a liquid deflector substantially in the form of an inverted cone, said deflector extending through said outlet coaxially with said column, being, in use, at least partially immersed and diverting the liquid flowing vertically through said column in a substantially radial direction with respect to said column;

a laminating plate located above said deflector and, in use, approximately level with the free surface of the liquid, said laminating plate having a central opening coaxial with said column, said opening being smaller than said laminating plate;

an upper axial gas intake conduit fixed to said laminating plate, coaxial and communicating with said central opening; and

means supported by said intake conduit for adjusting the axial position of said deflector relatively to said column.

4,442,046

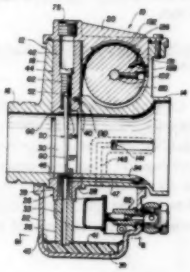
CARBURETOR

William H. Edmonston, 22021 Trailway, El Toro, Calif. 92630

Filed Mar. 31, 1982, Ser. No. 364,059

Int. Cl.³ F02M *9/06*

U.S. Cl. 261—44 B **6 Claims**



1. A carburetor, comprising:

a body having an inlet end, an outlet end, and a throat extending therethrough from said inlet end to said outlet end,

a fuel supply tube secured to the underside of said body and having an outlet in communication with said throat,

a throttle slide member movably mounted on the body intermediate said inlet and outlet ends thereof for substantially transverse movement across said throat to vary the unblocked portion thereof, and

a metering rod secured to said throttle slide member and extending downwardly into said fuel supply tube to control the flow of fuel therethrough,

a fuel reservoir secured to and disposed beneath said body, said fuel supply tube extending downwardly into said fuel reservoir, and

a fuel cell disposed on the bottom of said fuel reservoir and being adapted to absorb fuel therein, means covering the upper portion of said fuel cell to trap fuel therein, said covering means having an aperture therethrough, and the lower end of said fuel supply tube extending through said aperture into engagement with said fuel cell,

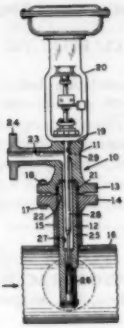
whereby said fuel cell and said covering means serve to reduce turbulence in the fuel and to prevent air from entering said fuel supply tube.

4,442,047

MULTI-NOZZLE SPRAY DESUPERHEATER

Roger E. Johnson, Girard, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Oct. 8, 1982, Ser. No. 433,505
Int. Cl.³ B01F 3/04
U.S. Cl. 261—66 10 Claims



1. A desuperheater, which comprises

(a) a cage structure including an internal flow path,

(b) a generally flat, rectangular nozzle surface formed on said cage structure,

(c) a plurality of slot-like openings formed through said cage structure and arranged in a predetermined pattern across the rectangular nozzle surface,

(d) each of said slot-like openings providing flow communication between the internal flow path and the rectangular nozzle surface,

(e) a plurality of nozzle means,

(f) each of said nozzle means including a swirl inducing structure and a fluid discharge opening,

(g) said nozzle means being arranged across and supported against said flat rectangular nozzle surface whereby each of said nozzle means is in flow communication with one of said slot-like openings,

(h) a valve seat formed at the lowermost end of said internal flow path, and

(i) a hollow piston plug received in a leak-tight relation within said internal flow path and arranged for selective, controlled axial displacement within said internal flow path through a predetermined work stroke,

(j) said plug being matable with said valve seat when said plug is at the lowermost end of its work stroke,

(k) said slot-like openings and said plug being arranged and configured whereby said plug physically covers and isolates all of said slot-like openings from flow communication with said internal flow path when said plug is seated against said valve seat,

(l) said plug including at least one flow port formed at a topmost portion of the plug whereby fluid flow in said internal flow path will flow through said port into the interior of the hollow plug and toward said valve seat,

(m) said plug including an opening formed at its lowermost end,

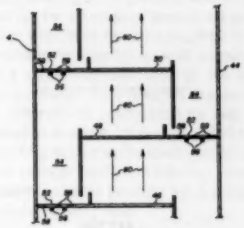
(n) said slot-like openings and said plug being arranged and configured with respect to one another whereby said slot-like openings are progressively and sequentially exposed to flow communication with said internal flow path as said plug is axially displaced within said internal flow path toward the upper end of its work stroke.

4,442,048

METHOD AND APPARATUS FOR CONTROLLING THE FORMATION OF POLYMER ACCUMULATIONS DURING DISTILLATION OF A VINYLAROMATIC MONOMER

Marshall Abernathy, Big Spring, Tex., and Darrell E. Bailey, Prairieville, La., assignors to Cosden Technology, Inc., Dallas, Tex.

Division of Ser. No. 230,617, Feb. 2, 1981, Pat. No. 4,374,000. This application Apr. 1, 1982, Ser. No. 364,479
Int. Cl.³ B01D 3/22
U.S. Cl. 261—114 R 15 Claims



1. Apparatus for controlling the formation of polymer accumulations on the underside of a seal pan underneath a downcomer in a downcommer-equipped distillation column used for distillative purification of a vinylaromatic monomer, said apparatus comprising:

at least one downcomer-equipped distillation column comprising a series of gas/liquid contact trays, at least some of said trays having associated therewith a downcomer and a seal pan positioned underneath said downcomer for providing a liquid seal between successive trays in said series; and

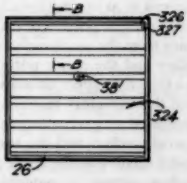
means, provided in at least one seal pan and including liquid pervious weep holes spaced and dimensioned therethrough, for allowing a liquid phase material containing an effective polymerization inhibiting concentration of polymerization inhibitor accumulated on said seal pan to seep through said weep holes to the underside of said seal pan.

4,442,049

APPARATUS FOR ENSURING HEAT EXCHANGE BETWEEN A GAS FLOW AND A HEAT EXCHANGER

Ivan Bloomer, London, England, assignor to Haden Schweitzer Corporation, Madison Heights, Mich.

Division of Ser. No. 205,479, Nov. 10, 1980, abandoned. This application Sep. 21, 1982, Ser. No. 420,968
Int. Cl.³ B01F 3/04
U.S. Cl. 261—148 5 Claims



1. Apparatus for ensuring heat exchange between gas flow and a heat exchanger, comprising a duct defined by longitudinally extending duct walls, means for establishing a flow of gas through the duct, a heat exchanger mounted to extend transversely in the duct such that gas flows therethrough, a rigid

diaphragm extending transversely within the duct and perpendicular to the duct walls, said diaphragm being disposed upstream of the heat exchanger in the direction of gas flow and sealed around its perimeter with respect to the duct walls, and means for spraying liquid mounted in the duct upstream of and adjacent said diaphragm and arranged to spray liquid towards the heat exchanger, said diaphragm including a plurality of flow passages extending therethrough and defining constrictions for said gas flow such that jets of gas are produced, said diaphragm further including means for adjusting the size of said flow passages.

4,442,050

SPRAY METHOD OF APPLYING MONOLITHIC REFRACTORY MATERIAL

Hosaka Takuo, Toyota, Japan, assignor to Nippon Crucible Co., Ltd., Tokyo, Japan

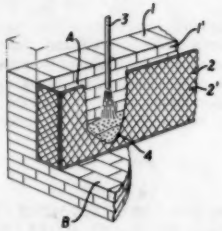
PCT No. PCT/JP78/00060, 371 Date Aug. 20, 1979, 102(e) Date Aug. 20, 1979, PCT Pub. No. WO79/00442, PCT Pub. Date Jul. 26, 1979

PCT Filed Dec. 19, 1978, Ser. No. 67,890

Claims priority, application Japan, Dec. 21, 1977, 52-153868

Int. Cl.³ F27D *1/16*

U.S. Cl. 264—30 5 Claims



1. A method of applying a monolithic refractory material to a work surface, comprising:

providing a screen having openings dimensioned to permit the flow of air therethrough and to effectively prevent the passage therethrough of refractory material which is to be applied to a work surface;

positioning the screen so as to substantially enclose the work surface such that a major portion of the screen is spaced a selected distance from the work surface to define between the work surface and the major portion of the screen a space having a thickness approximately corresponding to the thickness of the refractory material to be applied; and

spraying by compressed air a refractory material in the space between the work surface and the screen in a direction generally parallel relative to the work surface to progressively accumulate refractory material in the space between the screen and the work surface while permitting the air to escape through the screen openings both below and above the level of the accumulated refractory material to thereby form a layer of refractory material on the work surface free from trapped air.

4,442,051

ENCAPSULATION OF INDOMETHACIN

James S. Rowe, Twickenham, and John E. Carless, Reigate, both of England, assignors to Nicholas Proprietary Limited, Victoria, Australia

PCT No. PCT/AU81/00044, 371 Date Dec. 11, 1981, 102(e) Date Dec. 11, 1981, PCT Pub. No. WO81/02976, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 15, 1981, Ser. No. 330,313

Claims priority, application United Kingdom, Apr. 21, 1980, 8013003

Int. Cl.³ B01J *13/02*

U.S. Cl. 264—4.3 14 Claims

1. A method of encapsulating Indomethacin comprising mixing Indomethacin with a water-miscible liquid polyhydroxyalkane to form a dispersion or paste, dispersing said dispersion or paste in an aqueous solution of a gelatin/polysaccharide coacervate system, causing coacervation of said system to encapsulate Indomethacin with a coacervate complex, and hardening and dehydrating the resultant microcapsules.

4,442,052

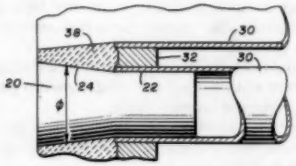
FORM FOR REFRACTORY-FACED TUBE SHEETS

Philip S. Reynertson, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 5, 1982, Ser. No. 365,209

Int. Cl.³ F27D *1/16*

U.S. Cl. 264—30 5 Claims



1. An apparatus for use in a vessel, having a shell and tube construction with refractory material protecting the tube sheet, to provide a flared entrance or exit for said tubes to reduce the pressure drop on the process fluid flowing through said vessel, comprising a form having a shank end and a flared end, said shank end being in the shape of a cylinder having a diameter less than the internal diameter of said tubes and a length of at least about 5 centimeters, and said flared end having a length at least equal to the thickness of said refractory and expanding conically outwardly at an angle of from about 15° to about 20°.

4. A method for reducing the pressure drop in a vessel having a shell enclosing a plurality of tubes which are retained by tube sheets wherein a refractory material is installed against said tube sheets comprising:

inserting a form in each of said plurality of tubes, said form having a shank end and a flared end, said shank end being in the shape of a cylinder having a diameter less than the internal diameter of said tubes but large enough to securely seat in each of said tubes and a length of at least about 5 centimeters, and said flared end having a length equal to or greater than the thickness of said refractory material and expanding conically outwardly at an angle of from about 15° to about 20°;

installing said refractory material to abut against said tube sheet and surrounding said forms; and

removing said forms after solidification of said refractory material to provide a conically flared passageway through said refractory material as the inlet to said tubes to reduce the pressure drop created by the flow of process material through said vessel.

4,442,053

METHOD OF AND APPARATUS FOR REPAIRING A LEAK IN A PIPE OR PIPELINE

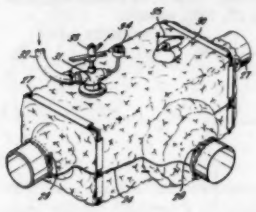
John Pickering, Belper; Ian Woodhouse, and Araspillai N. Ganendran, both of Burton-on-Trent, all of England, assignors to BTR Limited, London, England

Filed Jul. 21, 1982, Ser. No. 400,267

Claims priority, application United Kingdom, Aug. 11, 1981, 8124560

Int. Cl.³ B29C *1/02*

U.S. Cl. 264—36 12 Claims



1. In a method of repairing a leak in a pipe or pipeline comprising the steps of providing a mould around the pipe or pipeline by installing and securing a flexible mould around the pipe and introducing a sealant into the space so provided between the mould and pipe or pipeline, there being vent means from the mould space to atmosphere, the improvement being that the flexible mould has an inner skin and an outer skin which can be separated only by a limited amount, a mould forming material is introduced into the space defined between the skins, the mould-forming material is allowed to set to a rigid form to provide a rigid mould around the pipe or pipeline into which the said sealant is injected.

4,442,054

PROCESS FOR CONTINOUSLY MONITORING AND CONTROLLING THE PRODUCT FILM QUALITY FROM A POLYMER PRODUCTION UNIT

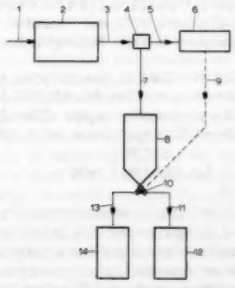
Lambertus M. Dane, Voerendaal; Johannes C. A. Engels, Sittard, and Cornelis L. Stevens, Geleen, all of Netherlands, assignors to Stamicarbon BV, Geleen, Netherlands

Filed May 14, 1981, Ser. No. 263,731

Claims priority, application Netherlands, May 14, 1980, 8002782

Int. Cl.³ B29H *19/00*

U.S. Cl. 264—40.1 4 Claims



1. A process for continuously monitoring and controlling the product film quality from a polymer production unit, and for automatically separating acceptable polymer product from unacceptable or off-specification polymer product, said process comprising the steps of:

(a) continuously formulating in said polymer production unit a particulated solid polymer product, and passing said product from said polymer production unit along a transport line to a product sampling point;

(b) periodically or continuously withdrawing a product sample at said product sampling point from said product transport line, supplying said product sample to an extruder and preparing a film therefrom;

(c) at least intermittently analyzing said film to determine the film properties thereof, while

(d) meantime continuously delivering the product lot remaining after sampling is practiced according to step (b) to a residence holding device which will retain said sampled product lot for a period of time equal to, or differing not more than 10% from the time required to perform the analysis according to step (c) on said sample; and

(e) providing a signal representative of the result of said analysis for operating a flow diverter device responsive to said signal, whereby as determined by said analysis, acceptable sampled product lot is then delivered from said residence holding device to the main product delivery line to a product storage facility, while any unacceptable or off-specification polymer product lot is instead delivered to a by-product delivery line.

4,442,055

PROCESS FOR THE MANUFACTURE OF A CONTACT MAT

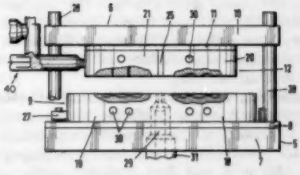
Jürgen Oelsch, Salz; Richard Volk, Brendlorenzen, and Karl-Heinz Claassen, Wülfershausen, all of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,520

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144084

Int. Cl.³ B29H *3/08*

U.S. Cl. 264—105 7 Claims



1. Process for the manufacture, by the injection-moulding process, of a contact mat which is suitable for a key board and consists of a sheet-like composite body made of an electrically non-conductive elastomeric material, comprising at least one carrier member elastically deformable upon application of pressure to a key formed therein, said carrier member being moulded in the shape of a calotte projecting out of the plane of the composite body, a respective contact component made of a vulcanizable, highly conductive material being joined to said carrier member, characterized in that the contact component is first moulded in an injection mould consisting essentially of a lower mould part and a bipartite upper mould part, the lower mould part being at a temperature above the vulcanization temperature of the contact component, one half of the upper mould part being at a temperature below the vulcanization temperature of the contact component wherein after the contact component has been fully vulcanized, the lower mould part is moved, relative to the upper mould part, from a first into a second position, and subsequently by means of runners in the lower mould part, the composite body and the carrier parts are moulded so that the contact component is rigidly joined to the carrier part, the temperatures of the lower mould part and of the other half of the upper mould part being above the vulcanization temperature of the composite body.

4,442,056

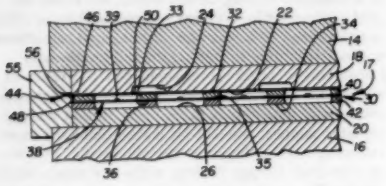
ENCAPSULATION MOLD WITH GATE PLATE AND METHOD OF USING SAME

Dusan Slepcevic, 10370 Alpine Dr., Cupertino, Calif. 95014

Continuation-in-part of Ser. No. 194,593, Dec. 6, 1980, Pat. No. 4,368,168, which is a division of Ser. No. 925,295, Jul. 17, 1978, Pat. No. 4,332,537. This application Jan. 10, 1983, Ser. No. 456,693

Int. Cl.³ B29C 1/00; B29D 3/00, 31/00

U.S. Cl. 264—161 19 Claims



1. A method for encapsulating objects (39) held by a lead frame strip (38) comprising:

(a) loading the lead frame strip (38) with the objects (39) held thereby in a cavity plate structure (30) having first (32) and second (34) oppositely facing generally planar outer surfaces (32, 34) and a plurality of openings (36) extending from said first outer surface (32) towards said second outer surface (34) with said objects (39) in said openings (36);

(b) positioning said loaded cavity plate structure (30) in a molding apparatus (10) between first (18) and second (20) mold plates (18, 20) mounted to opposed mold bases (14, 16), said first mold plate (18) having a generally planar first surface (22) having a feed runner network (24) formed therein and said second mold plate (20) having a generally planar second surface (26) opposed to said first surface (22), with said second outer surface (34) of said cavity plate structure (30) facing said second surface (26) and said first outer surface (32) facing and spaced from said first surface (22);

(c) positioning a gate plate (44) having first (46) and second (48) generally planar outfacing surface portions (46, 48) and a plurality of apertures (50) from said first outfacing surface portion (46) to said second outfacing surface portion (48) with said first outfacing surface portion (46) facing said first surface (22) of said first mold plate (18) and said second outfacing surface portion (48) facing said first outer surface (32) of said cavity plate structure (30) and with said apertures (50) in registration with said openings (36) in said cavity plate structure (30);

(d) moving said first (18) and second (20) mold plates (18, 20) together sufficiently so that said first surface (22) contacts said first outfacing surface portion (46) and connects said feed runner network (24) to said apertures (50), said second outfacing surface portion (48) contacts said first outer surface (32) and said second outer surface (34) contacts said second surface (26);

(e) injecting a fluid encapsulating material into said feed runner network (24), through said apertures (50) and into said openings (36) in sufficient quantity to encapsulate said objects;

(f) maintaining the mold apparatus (10) closed until the encapsulating material has set;

(g) opening the molding apparatus (10);

(h) separating the gate plate (44), with the set runners (71) from the feed runner network (24) held to the first outfacing surface (46), orthogonally from the first surface (22);

(i) moving the gate plate (44) laterally across the first outer surface (32) sufficiently to fully separate the first outer surface (32) from the second outfacing surface portion (48); and

(j) removing the set runners (71) from the first outfacing surface portion (46).

4,442,057

MELT SPINNING PROCESS

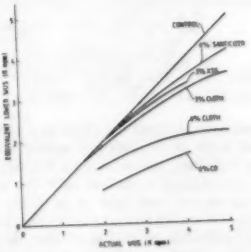
Harry Brody, Harrogate, North Yorkshire, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 29, 1981, Ser. No. 268,249

Claims priority, application United Kingdom, May 30, 1980, 8017685; Jul. 29, 1980, 8024694

Int. Cl.³ D01D 1/04

U.S. Cl. 264—176 F 7 Claims



1. A process of melt spinning a fibre-forming thermoplastic polymer the improvement comprising adding to the fibre-forming thermoplastic polymer a small proportion of a polymer capable of forming an anisotropic melt in the temperature range at which the thermoplastic polymer may be melt spun together and the polymers are then melt spun together in intimate mixture at a minimum wind up speed of 1 kilometer per minute whereby in the process there is suppre sion of wind up speed compared with the process carried out in the absence of the added polymer.

4,442,058

ESTERIFICATION OF CARBOXYL END GROUPS EMPLOYING ADDITION OF OXIRANE COMPOUNDS

Ronald L. Griffith, Charlotte, N.C., and Nicolai A. Favstritsky, Broomall, Pa., assignors to Fiber Industries, Inc., Charlotte, N.C.

Continuation of Ser. No. 416,731, Sep. 10, 1982, abandoned, which is a continuation-in-part of Ser. No. 170,339, Jul. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 913,417, Jun. 7, 1978, abandoned. This application Jul. 5, 1983, Ser. No. 510,781

Int. Cl.³ D01F 1/00

U.S. Cl. 264—176 R 11 Claims

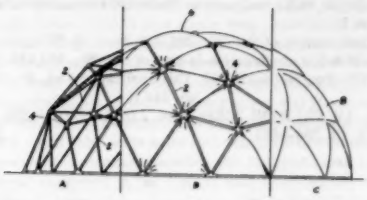
1. A method of improving the intrinsic viscosity and reducing the carboxyl end group concentration in melt spun fibers of high-molecular weight polyester polymers comprising adding to the molten linear condensation polymer and reacting therewith in the molten state from about 0.05 to less than 0.25 percent, by weight based on the weight of polymer, of an oxirane compound selected from the group consisting of ethylene oxide; 1,2-epoxypropane; 1,2-epoxybutane; and 1,2-epoxy-2methylpropane, said oxirane compound being added to said polymer 1 to 30 minutes prior to the polymer extrusion operation.

4,442,059

RIGID BUILDING FRAME WITH INFLATABLE MEMBER

Norman A. Boyce, 38 Ratby La., Markfield, Leicester, England

Filed Jul. 13, 1982, Ser. No. 397,931
Claims priority, application United Kingdom, Jul. 14, 1981, 8121683; Jan. 20, 1982, 8201584
Int. Cl.³ B28B 9/04
U.S. Cl. 264—228 10 Claims



1. A method of building construction comprising the steps of (a) erecting a rigid skeletal framework of struts or tubular members to define the contours of the desired building, and securing the struts or members together at appropriate intersections thereof to form support zones, (b) providing within said framework an air-impervious membrane so as to provide an airtight envelope, (c) inflating said envelope within said framework at sufficient pressure to take said framework from an as-assembled state of component compression between the struts or members to a state in which there is tension between the components, (d) coating the external surface of said inflated membrane with settable material, and (e) returning the air pressure within the envelope to normal thereby permitting the struts or members to return to a non-tensioned state and detach from the newly set material, said material being arranged to remain in contact with support zones situated at the intersection of the struts or members.

4,442,060

INJECTION-MOLDING OF PASTY, THERMOSETTING ORGANOPOLYSILOXANE COMPOSITIONS

Noel Bouverot, Saint Symphorien D'Ozon; Paul Medard, Oullins, and Alain Viale, Venissieux, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jan. 7, 1982, Ser. No. 337,844
Claims priority, application France, Jan. 7, 1981, 81 00114
Int. Cl.³ B29G 3/00
U.S. Cl. 264—328.2 11 Claims

1. A process for the production of an injection-molded, elastomeric shaped article, comprising injection-molding, at a temperature ranging from about 125° C. to about 225° C., a pasty organopolysiloxane composition of matter having a viscosity ranging from about 4,000 to 55,000 Pa.s at 25° C. comprising an intimate admixture of:

(A_1) 100 parts by weight of a diorganopolysiloxane oil having a viscosity of 500 to 300,000 mPa.s at 25° C., consisting essentially of recurring units of the formula R_2SiO and blocked at each end of the chain by units of the formula $R_2R'SiO_{0.5}$, in which formulae the symbols R, which are identical or different, represent hydrocarbon radicals which are unsubstituted or substituted by halogen atoms or cyano groups and which have 1 to 8 carbon atoms, and the symbol R' represents the same radicals as the symbols R and also a hydroxyl radical, an alkoxy radical having from 1 to 4 carbon atoms or a β-methoxyethoxy radical;

(B_1) 10 to 75 parts by weight of a finely divided, reinforcing silica having a specific surface area of at least 50 m^2/g;

(C_1) 1 to 20 parts by weight of a structuring inhibitor; and

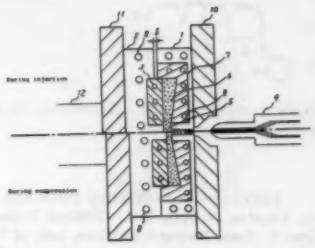
(D_1) 0.1 to 4 parts by weight of 2,4-dichlorobenzoyl peroxide cross-linking agent.

4,442,061

HEAT CYCLE INJECTION COMPRESSION MOLDING METHOD

Shunsuke Matsuda, Osaka; Akio Ito, Katano; Mitani Katsuaki, Kyoto; Murakami Yoshinobu, Katano, and Tamura Tooru, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 15, 1982, Ser. No. 398,696
Claims priority, application Japan, Jul. 16, 1981, 56-111775
Int. Cl.³ B29F 1/06
U.S. Cl. 264—328.7 3 Claims



1. A heat cycle injection compression molding method comprising the steps of:

heating a synthetic resin until it becomes fluidized;

injecting the fluidized synthetic resin into a large and nonuniform cavity formed by a cavity block in a mold which is slightly opened;

cooling the injected fluidized resin until the center portion temperature of the resin is equal to or lower than a solidifying temperature of the resin, thereby solidifying the resin;

reheating the solidified resin uniformly until the temperature of the resin is higher than the solidifying temperature, thereby making the resin fluidized again;

compressing the refluidized resin by reducing the volume of the cavity;

cooling the refluidized resin until the temperature of the refluidized resin is lower than a take-out set temperature, while continuing said compressing step, thereby resolidifying the resin;

stopping the compressing step; and

ejecting out of the mold a formed product having a large and nonuniform thickness.

4,442,062

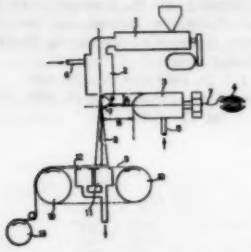
PROCESS FOR PRODUCING MELT-BLOWN THERMOPLASTIC ARTICLES

Shigeo Fujii; Tokuzo Ikeda; Takashi Mikami, and Shuji Okano, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 882,596, Mar. 2, 1978, Pat. No. 4,238,175. This application Oct. 2, 1980, Ser. No. 193,234
Int. Cl.³ B28B 5/00
U.S. Cl. 264—518 2 Claims

1. A process for the production of a non-woven structure, said process comprising blowing a thermoplastic resin with a high speed hot gas to form a fiber stream of fine thermoplastic resin fibers, blowing uniformly at least one continuous yarn at

the rate of 30 to 40 m/sec. and at an angle of about 30° to about 140° into the thermoplastic resin fiber stream from a distance of



about 10 mm to about 1000 mm and collecting the thermoplastic fiber stream.

4,442,063

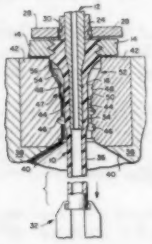
CONTAINER FORMING PROCESS

Harry A. Younkin, Newark, Del.; Gottfried Mehnert, Berlin, and Uwe V. Roos, Bodenteich-Uelzen, both of Fed. Rep. of Germany, assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 249,723, Mar. 31, 1981, Pat. No. 4,382,769. This application Sep. 28, 1982, Ser. No. 425,579

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—532 **15 Claims**



1. In a method of blow molding from a tubular parison of orientable plastic material in substantially unoriented condition, but at a suitable orientation temperature, a hollow container, the material of which is biaxially oriented, which has a neck with at least one lateral projection such as a thread or the like for engagement with a container closure, the inside diameter of at least the container neck portion of said tubular parison being substantially the inside diameter of the neck opening, the improvement comprising:

positioning the container neck portion of said parison on a mandrel having a stem part, the outside diameter of the stem part being substantially less than the inside diameter of the neck opening and the length being approximately the axial length of said neck, which stem part merges into a calibration part, the outside diameter of which is substantially the inside diameter of said neck, the neck end of the parison when said container neck portion is in position being around said calibration part;

securing the neck end of said parison in said position;

stretching the parison longitudinally to orient substantially longitudinally said material and cause the parison to neck down onto the stem part of said mandrel;

closing on the stretched parison separable sections of a mold having a container body and neck forming cavity;

inflating the parison to conform the same substantially to the cavity and to orient transversely said material; and

inserting the calibration part of the mandrel substantially to the inner end of the neck portion of the parison to calibrate substantially the entire length of the container neck opening, and to further urge the material in the neck portion of the parison into closer conformity with any lateral projection forming recess of said cavity.

4,442,064

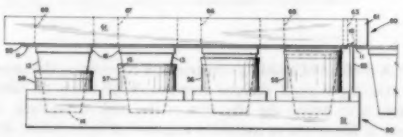
THERMOFORMING AND SELF-ALIGNMENT TRIMMING METHOD AND APPARATUS

Donald W. Myers, and Samantha L. Vivlamore, both of Canandaigua, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 206,201, Nov. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 942,836, Sep. 15, 1978, Pat. No. 4,239,727. This application Oct. 29, 1981, Ser. No. 316,174

Int. Cl.³ B29D *27/00;* **B29C** *17/03, 17/10;* **B29H** *3/06*

U.S. Cl. 264—551 **24 Claims**



1. In the manufacture of plastic articles by thermoforming a plurality of plastic articles from a plastic sheet, a method of trimming said articles from the connecting web remaining from said sheet, comprising:

A. providing a plurality of article punches and approximately registering said articles with said punches;

B. loosely fitting said registered articles within said punches, whereby said articles are loosely supported by said punches;

C. shearing said web between all said registered and loosely fitted articles, whereby all said articles have complete freedom of movement, each registered and loosely fitted article being movable independently of all surrounding articles;

D. exactly registering said independently movable articles with said supporting punches and providing a plurality of article dies which are stationary and in close proximity with said connecting web and in trimming relationship to said articles; and

E. moving said punches towards and into said dies thereby trimming said articles from said web with said punches and said dies.

4,442,065

RETROFITTABLE NUCLEAR REACTOR CORE CATCHER

Albert L. Latter, Marina del Rey; R. Philip Hammond, and James L. Dooley, both of Santa Monica, all of Calif., assignors to R & D Associates, Marina del Rey, Calif.

Filed Dec. 1, 1980, Ser. No. 211,519

Int. Cl.³ G21C *9/00*

U.S. Cl. 376—280 **7 Claims**

1. A passive system for the prevention of the escape of radioactive material to the biosphere from a nuclear reactor plant suffering a major core-destructive accident with meltdown of the reactor, said nuclear reactor plant having a main above-ground structural containment shell, said system comprising:

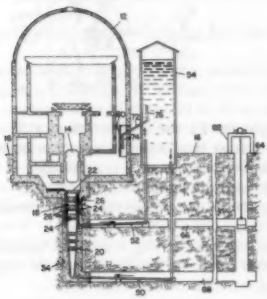
an isolation conduit or tube extending downward from the floor of the nuclear reactor plant immediately below the reactor core, said isolation conduit or tube including an outer reinforced concrete shell, refractory lining material within the concrete shell and an inner layer of a high strength, high temperature resistant metal; said isolation tube having a diameter which is the same order of magni-

tude as said core, and a depth at least two times greater than its diameter;

a relatively thin sealing layer extending over the upper end of said isolation tube;

means mounted within said isolation tube for delaying the descent of said core through said isolation tube following melt-down;

a core-catcher heat exchanger having a relatively large surface area mounted below said isolation tube to receive melted core material flowing through said isolation tube; said isolation conduit and said core-catcher heat exchanger being formed as a single long sustantially vertically extending channel, said heat exchanger including an inner structural liner of good heat transfer material forming an inner metal wall surrounding said channel and a thin enclosing water jacket having upper and lower conduits and said core-catcher heat exchanger having a sufficiently small cross-section for containing the core material to preclude a critical assembly for the particular core material employed in the reactor, said core-catcher heat exchanger being of a size and shape for sufficiently cooling the molten core material to provide a solid liner



formed from said molten core material on the inner wall of said core-catcher heat exchanger, wherein an outer reinforced concrete shell extends the length of said core-catcher heat exchanger and the cross-section of said channel at its lower end being sufficiently small so as to preclude said critical assembly, said water jacket having an outer wall spaced a short distance from said inner metal wall to provide said thin water jacket, supporting means in said space for maintaining said inner and outer walls in said spaced relation, means mounted within said core-catcher heat exchanger for delaying the descent of said molten core material through said core-catcher heat exchanger;

a passive body of cooling water positioned adjacent the main nuclear reactor plant, said body of cooling water being open to the atmosphere to permit the boiling off of water;

means for coupling said upper and lower conduits to said body of cooling water, to facilitate the flow of heat between said core-catcher heat exchanger and said body of cooling water; and

additional passive heat exchanger means coupled between the space within said reactor plant containment shell and said body of cooling water.

4,442,066

SUPPORTING FLOOR FOR THE CORE OF A NUCLEAR REACTOR

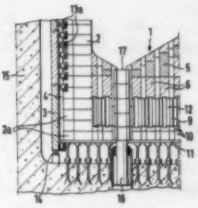
Josef Schoening, Hambruecken; Hans-Georg Schwiers, Ketsch; Claus Elter, Bad Durkheim; Rolf Fritz, Oftersheim, and Karl-Friedrich Kissel, Laudenbach, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Jul. 16, 1980, Ser. No. 169,282

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1979, 2929741

Int. Cl.³ G21C *11/00*

U.S. Cl. 376—302 **12 Claims**



1. A support floor for the core of a high temperature pebble bed nuclear reactor comprising:

a plurality of support columns placed directly adjacent one another forming the reactor core floor;

a bed of spherical fuel elements forming the reactor core;

a cylindrical side reflector surrounding said columns and the reactor core;

a thermal side shield arranged at a distance around said cylindrical side reflector to form an annular space; and

means for retaining said support columns in their respective horizontal positions said means disposed in said annular space between the lower part of the side reflector and the thermal side shields to substantially prevent the formation of expansion gaps between said columns.

4,442,067

MATERIAL FOR SEMICONDUCTOR HOLDER IN ELECTRON BEAM WRITING APPARATUS

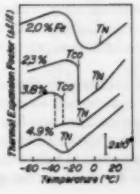
Yoshinobu Saito, and Sakae Sugimoto, both of Sendai, Japan, assignors to Tohoku Tokushuko Kabushiki Kaisha, Miyahiken, Japan

Filed Dec. 14, 1982, Ser. No. 449,623

Claims priority, application Japan, Dec. 22, 1981, 56-207315

Int. Cl.³ C22C *27/06*

U.S. Cl. 420—428 **3 Claims**



1. Material for semiconductor holder in electron beam writing apparatus consisting of 3.0–7.0% by weight of iron, 0.2-less than 1.5% by weight of manganese, 0.001–1.0% by weight of at least one rare earth element, and remainder of chromium and inevitable impurity, said material having magnetic susceptibility of not more than 3.5×10^{-5} emu/g and a thermal expansion coefficient of $0–2.5\times10^{-6}$/°C. at a temperature of 0° C.–40° C.

4,442,068

HEAT RESISTANT CAST IRON-NICKEL-CHROMIUM ALLOY

Junichi Sugitani, Hirakata; Teruo Yoshimoto, Suita, and Makoto Takahashi, Hirakata, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Sep. 17, 1982, Ser. No. 419,310
Claims priority, application Japan, Oct. 12, 1981, 56-162482
Int. Cl.³ C22C 30/00
U.S. Cl. 420—584 1 Claim

1. A heat resistant cast iron-nickel-chromium alloy consisting essentially of the following components in the following proportions in terms of % by weight:

C: 0.3–0.6,
$0 < Si \leqq 2.0$,
$0 < Mn \leqq 2.0$,
Cr: 20–30,
Ni: 30–40,
W: 0.5–5.0,
N: 0.04–0.15,
B: 0.0002–0.004,
Ti: 0.04–0.50 and
$0.07 < Al \leqq 0.50$

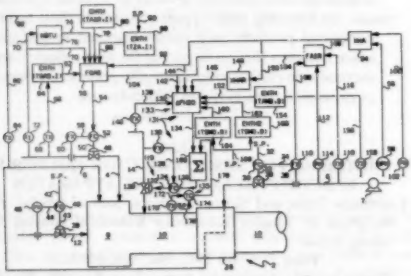
the balance being substantially Fe.

4,442,069

CARBON BLACK FURNACE APPARATUS

Merle R. Likins, Jr., and Galen D. Stacy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 211,984, Dec. 1, 1980, Pat. No. 4,351,818. This application Sep. 17, 1982, Ser. No. 419,297
Int. Cl.³ C09C 1/00, 1/48; G01N 33/00
U.S. Cl. 422—62 6 Claims



1. In a carbon black reactor comprising

a means defining a first reaction zone;

a fuel conduit communicating with said first reaction zone;

an air conduit communicating with said first reaction zone;

an effluent conduit communicating with said first reaction zone;

a means for heat exchanging the effluent in said effluent conduit with the air in said air conduit to pre-heat the air prior to introduction into said first reaction zone; and

a means for defining a quench fluid conduit communicating with said effluent conduit between said first reaction zone and said means for heat exchanging; the improvement comprising:

(a) a means for determining the moisture content of the air and for establishing a first signal representative of the moisture content of the air, and means for generating a modified quench fluid flow rate signal derived at least in part from the moisture content of air entering the air conduit;

(b) a means for determining the flow rate of the quench fluid and generating a representative signal; and

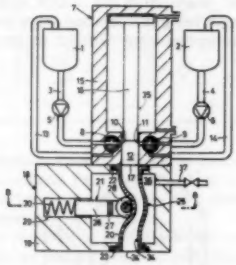
(c) a flow control means in association with the quench fluid conduit for controlling the quench fluid flow rate through the quench fluid conduit in response to the modified quench fluid flow rate signal and the signal representative of the rate of fluid flow through the quench fluid conduit.

4,442,070

APPARATUS FOR THE PRODUCTION OF A FLOWABLE REACTION MIXTURE

Ferdinand Proksa, Leverkusen; Hans-Michael Sulzbach, Koenigswinter, and Reiner Raffel, Siegburg, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,632
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111957
Int. Cl.³ B01J 5/04, 15/02; B01S 14/00
U.S. Cl. 422—133 8 Claims



1. An apparatus for the production of a flowable reaction mixture of at least two flowable components which mixture forms a foam or solid material, comprising:

(a) storage means for said components;

(b) supply lines leading from the storage means via metering pumps to a mixing head;

(c) said mixing head having a mixing chamber;

(d) injection openings connected to said supply lines and opening into said mixing chamber;

(e) said mixing chamber having an outlet opening downstream of said injection openings;

(f) said outlet opening having an elastic outlet tube whose throughflow cross section may be varied connected thereto;

said apparatus further characterized in that:

(g) the outlet tube has at least one means associated therewith for deflecting said outlet tube;

(h) an ejection piston is associated with said outlet tube, which piston is capable of filling the outlet tube; the contour of the inside wall of said outlet tube corresponding to the external contour of said ejection piston.

4,442,071

EXTRACTION OF PLUTONIUM IONS FROM AQUEOUS SULFURIC ACID SOLUTIONS WITH D_2EHPA OR $D_2EHPA/TOPO$

Karl H. Lieser, Seeheim-Jugenheim, and Bernd Stojanik, Rodgau, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jul. 23, 1981, Ser. No. 286,168
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3028024
Int. Cl.³ C01G 43/00
U.S. Cl. 423—10 9 Claims

1. Method for separating plutonium ions from an aqueous solution containing sulfuric acid, comprising:

(a) introducing into the aqueous solution 0.1 to 1.5 moles of nitrate ions per liter of aqueous solution;
(b) adding to the aqueous solution containing nitrate ions, an organic phase comprising a solution of 0.1 to 1.0 M di-2-ethylhexylphosphoric acid in kerosene in an amount sufficient that the volume ratio of the aqueous solution containing nitrate ions to the organic phase is between 1:1 and 4:1, to extract the plutonium ions into the organic phase;
(c) separating the organic phase containing plutonium ions from the aqueous solution;
(d) adding to the separated organic phase, a re-extractant aqueous solution containing 0.2 to 1.0 M oxalic acid, and 0 to 0.5 M nitric acid, to re-extract the plutonium ions into the re-extractant aqueous solution; and
(e) separating the re-extractant aqueous solution containing plutonium ions from the organic phase.

4,442,072

SELECTIVE RECOVERY OF BASE METALS AND PRECIOUS METALS FROM ORES

Elizabeth G. Baglin, and John M. Gomes, both of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 20, 1982, Ser. No. 435,534
Int. Cl.³ C01G *55/00, 7/00, 3/10, 53/10*
U.S. Cl. 423—22 **3 Claims**

1. A process for recovery of nickel, iron, copper, platinum, palladium and gold values from ore concentrates consisting essentially of:
(a) smelting the concentrate with a flux to form a matte and slag,
(b) grinding the matte to a particle size suitable for leaching,
(c) leaching, in a first-stage, the ground matte with sulfuric acid of a concentration of about 10 to 40 wt-pct at a temperature of about 40° to 100° C. and atmospheric pressure to selectively extract nickel and iron values, and
(d) roasting and leaching, in a second-stage, the residue from the first-stage leach, the roasting being at a temperature of about 300° to 500° C., and the leaching being with dilute sulfuric acid at ambient temperature and pressure, to selectively extract copper values and provide a residue containing a high concentration of platinum, palladium and gold.

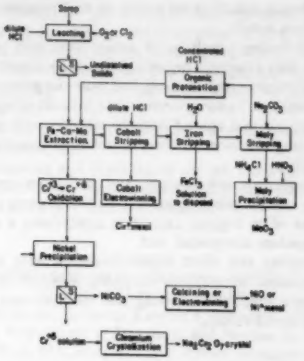
4,442,073

SEPARATION AND RECOVERY OF METAL ALLOYS FROM SUPERALLOY SCRAP

Douglas J. Robinson, and Aniedi O. Ette, both of Tucson, Ariz., assignors to University Patents, Inc., Norwalk, Conn.

Filed May 21, 1982, Ser. No. 380,859
Int. Cl.³ C01G *37/14, 53/00*
U.S. Cl. 423—54 **7 Claims**

1. A method of recovering metal values from superalloy scrap comprising the steps of:
(i) oxidizing the superalloy scrap in an aqueous acidic media, said aqueous acidic media having an oxidation potential sufficient to oxidize valve metals to insoluble solid oxides thereof, and to oxidize non-valve metals to aqueously soluble ionic species wherein the chromium values are oxidized to the +3 valence;
(ii) separating the insoluble solids from the aqueous solution;
(iii) extracting the aqueous solution with an aqueously substantially insoluble tertiary amine to form an organic phase containing the non-valve metal values except for the nickel and chromium values and an aqueous phase containing nickel and chromium values; and
(iv) separating the aqueous phase containing the nickel and chromium values from the organic phase wherein the improvement comprises the steps of:
(v) oxidizing the chromium +3 to aqueous-soluble chromium +6;
(vi) deacidifying the aqueous phase to a pH of about 7–10 with a soluble carbonate to form insoluble nickel carbonate;
(vii) precipitating the nickel carbonate from the chromium-containing solution;



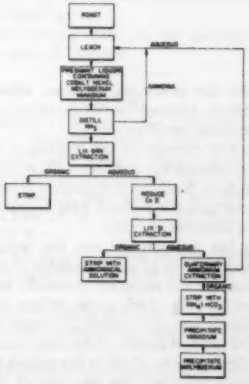
(viii) recovering the nickel from the nickel carbonate precipitate; and
(ix) recovering the chromium from the solution.

4,442,074

RECOVERY OF COBALT, MOLYBDENUM, NICKEL AND VANADIUM FROM AN AQUEOUS AMMONIA AND AMMONIUM SALT SOLUTION BY SERIAL EXTRACTION OF NICKEL AND COBALT AND COEXTRACTING MOLYBDENUM AND VANADIUM

Gale L. Hubred, Richmond, and Dean A. Van Leirsburg, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 24, 1982, Ser. No. 422,989
Int. Cl.³ C01G *31/00, 39/00, 51/00, 53/00*
U.S. Cl. 423—54 **4 Claims**



1. A process for separating the metal values in a pregnant liquor from an ammoniacal ammonium aqueous leach solution containing:
(i) at least one metal value selected from the group consisting of cobalt and nickel; and
(ii) at least one metal value selected from the group consisting of vanadium and molybdenum; comprising the steps of:
(a) transferring nickel from said pregnant liquor into a first

organic solution by means of a first organic liquid extractant comprising an oxime;

(b) stripping said first organic solution with an aqueous stripping solution to form a nickel-containing aqueous solution;

(c) reducing cobalt metal values in said pregnant liquor to divalent cobalt;

(d) transferring cobalt metal values from said pregnant liquor into a second organic solution by means of an organic cobalt extractant selected from the group consisting of dioximes, hydroxy-oximes and beta-diketones;

(e) stripping said second organic solution with an aqueous stripping solution to form a cobalt-containing aqueous solution;

(f) transferring molybdenum and vanadium metal values from said pregnant liquor into a third organic solution by means of an organic extractant comprising a quaternary ammonium compound; and

(g) stripping said third organic solution with an aqueous ammonium bicarbonate stripping solution to form an aqueous solution containing said molybdenum and vanadium metal values.

4,442,075

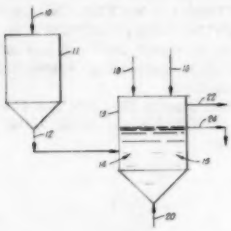
TITANIUM ORE CHLORINATION PROCESS USING A MOLTEN SALT

Theodore A. Rado, Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Mar. 30, 1983, Ser. No. 480,252

Int. Cl.³ C01G *23/02*

U.S. Cl. 423—76 **8 Claims**



1. A process for producing titanium tetrachloride from natural or synthetic titanium ore, carbonaceous reductant and chlorine, comprising the steps of:

providing a first quantity of salt, melting at between about 600 degress centigrade and about 900 degrees centigrade, in molten form having a temperature between about 800 degrees centigrade and about 1000 degrees centigrade to produce a chlorination zone;

introducing the titanium ore and the reductant into the chlorination zone to produce a loaded chlorination zone, the titanium ore and reductant essentially being suspended in the first quantity of salt in the molten form;

passing chlorine into the loaded chlorination zone to produce a first product stream comprising titanium tetrachloride, the first quantity of salt in the molten form cooperating to retain relatively fine particles of titanium ore or reductant or combinations thereof thereby permitting the use of smaller sizes of titanium ore or reductant or combinations thereof and the first quantity of salt in the molten form cooperating to form double salts in the loaded chlorination zone and to retain a substantial portion of some impurities for reducing the impurities in the first product stream; and

passing the first product stream from the loaded chlorination zone.

4,442,076

ENTRAINED DOWNFLOW CHLORINATION OF FINE TITANIFEROUS MATERIAL

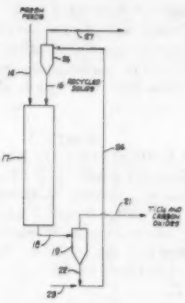
James P. Bonsack, Aberdeen, Md., assignor to SCM Corporation, New York, N.Y.

Filed Nov. 17, 1982, Ser. No. 442,313

The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.

Int. Cl.³ C01G *23/02*

U.S. Cl. 423—78 **4 Claims**



1. In an entrained flow process for chlorinating fine iron-containing titaniferous powder with chlorine gas and/or organochloride in the presence of fine porous coal-based reductant powder for obtaining as products titanium and iron chlorides wherein both of said powders are entrained in and flow downwardly through a chlorination reaction zone at a temperature of at least about 800° C., the improvement which comprises:

supplying titaniferous and reductant powders of −140 mesh to said reaction zone at a rate sufficient for establishing and maintaining titanium, iron, and carbon reactants therein in substantial excess over those stoichiometric for complete reaction of the chlorine present;

employing as at least the major portion of fresh reductant powdered reactive coal char having surface area of at least about 10 $m.^2/g.$ and particle size of −140 mesh;

separating carbon and titaniferous solids from the effluent of said reaction zone; and

recycling at least the major portion of the resulting separated solids as −140 mesh powder into said reaction zone.

4,442,077

METHOD OF REMOVING HYDRIDES OF PHOSPHORUS, ARSENIC, ANTIMONY AND BISMUTH FROM HYDROCARBON AND NON-HYDROCARBON STREAMS

David I. Foster, Lake Charles, La.; Paul T. Scott; Mark W. Pierick, both of Corpus Christi, Tex., and Clarence L. Shaddock, Jr., Lake Charles, La., assignors to Chemical Engineering Technology, Inc., Lake Charles, La.

Filed Sep. 27, 1982, Ser. No. 423,796

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—210 **13 Claims**

1. A method for removing a hydride of an element selected from the group consisting of phosphorous, arsenic, antimony, bismuth, or mixtures thereof from a petroleum hydrocarbon stream primarily having C_1-C_5 hydrocarbons and hydrogen, or from a non-hydrocarbon gas stream including a gas selected from the group consisting of nitrogen, oxygen, carbon monoxide, air, and a gas or gases of Group O, or mixture of the gases thereof; or a mixture of the hydrocarbon stream and the non-hydrocarbon gas stream; the method comprising the steps of:

(a) raising the predetermined known temperature of the hydrocarbon stream of the non-hydrocarbon gas stream

or the mixtures of the two streams to between 120° F. and about 170°; and

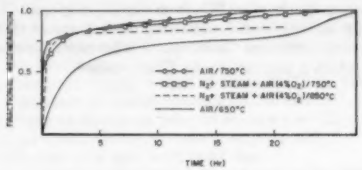
(b) contracting for at least 8 seconds the effluent of step (a) with a soda lime bed formation means having at least a five (5) foot length.

4,442,078

METHOD OF REMOVING HYDROGEN SULFIDE FROM GASES UTILIZING A ZINC OXIDE SORBENT AND REGENERATING THE SORBENT

Vinod M. Jalan, Concord, and David G. Frost, Maynard, both of Mass., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 7, 1982, Ser. No. 395,894
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—230 1 Claim



1. A method of repetitively generating a spent sorbent containing zinc sulfide to form zinc oxide in conjunction with a hydrogen sulfide sorption process, wherein said zinc oxide sorbent is repetitively spent to form zinc sulfide, said method in each repetition consisting essentially of contacting said spent sorbent with a desorbent gas mixture flow consisting essentially of approximately 55% nitrogen, 25% steam and 20% air (4% oxygen) by volume at a space velocity of about 3200 gas to sorbent volumes per hour at a temperature of about 650° C. for a period of about 2 to 3 hours to provide about 75% sorbent renewal.

4,442,079

PROCESS FOR REMOVAL OF NITROGEN OXIDES AND SULFUR OXIDES FROM WASTE GASES

James R. Donelly, Ballerup; Karsten S. Felsvang, Allerod, Denmark; Per Morsing, Vedbaek, all of Denmark, and Preston L. Veltman, Severna Park, Md., assignors to A/S Niro Atomizer, Soborg, Denmark

Filed May 28, 1982, Ser. No. 382,968
Claims priority, application Denmark, Oct. 12, 1981, 4507/81
Int. Cl.³ B01J *8/00;* C01B *21/00, 17/00*
U.S. Cl. 423—239 9 Claims

1. A process for removal of nitrogen oxides and sulfur oxides from waste gases in which the molar ratio of nitrogen oxides to sulfur oxides is 3 or below comprising subjecting said waste gases to a nitrogen oxides removing contact by contacting said waste gases with a particulate material comprising an alkaline earth based absorbent for sulfur oxides which absorbent also includes an additive selected from (i) sodium sulfite, (ii) sodium compounds forming sodium sulfite by contact with SO_2, (iii) divalent iron together with EDTA and (iv) mixtures thereof in an amount of 1–20% based on the weight of said absorbent, securing during at least a part of the contact period a temperature of the gas of 85°–145° C. and the presence of H_2O and at least 0.5% by volume oxygen.

2. A process for removal of nitrogen oxides and sulfur oxides from hot waste gases in which the molar ratio of nitrogen oxides to sulfur oxides is below 3, comprising the steps of

(a) preparing an aqueous suspension comprising a basic alkaline earth metal compound;

(b) atomizing said suspension into the hot waste gas in a drying chamber for simultaneous drying of the resulting atomized droplets and absorption of a portion of the sulfur oxides in the waste gas, the amount of basic compound atomized being restricted to secure the molar ratio of nitrogen oxides to sulfur oxides in the gas does not exceed 3,

(c) maintaining an O_2-concentration in the waste gas of 0.5% by volume or above;

(d) introducing the gas together with entrained particles formed by the drying and absorption in step (b) into a particle separation device securing that during at least a part of the residence time of the gas and the particles in said separation device the temperature of the gas is 85°–145° C.;

(e) withdrawing the particles separated in said particle separation device; and

(f) withdrawing and discharging the gas from said particle separation device with a substantially decreased content of nitrogen oxides and sulfur oxides.

4,442,080

FLUID BED SOX/NOX PROCESS—"HYDRATED CALCINE ABSORPTION"

James R. Donnelly, Bailerup; Karsten S. Felsvang, Allerod; Per Morsing, Vedbak, all of Denmark, and Preston L. Veltman, Severna Park, Md., assignors to A/S Niro Atomizer, Soeborg, Denmark

Continuation-in-part of Ser. No. 382,968, May 28, 1982. This application Jun. 1, 1982, Ser. No. 383,999
Claims priority, application Denmark, Oct. 12, 1981, 4507/81
Int. Cl.³ B01J *8/00;* C01B *21/00, 17/00*
U.S. Cl. 423—239 21 Claims

1. A process for treating a gaseous mixture containing SO_x and NO_x wherein the molar ratio of NO_x to SO_x is 3 or below and wherein both SO_x and NO_x are removed which comprises:

a. providing a reactor for particulate material wherein the particles are in motion relative to each other;

b. said particles having a surface comprising alkaline earth hydroxide reactable with said SO_x and NO_x, in admixture with the reaction products of said SO_x and NO_x and alkaline earth hydroxide;

c. contacting the particles in said reactor with the gaseous mixture at a temperature of between about 85° C. and about 150° C. in the presence of at least 0.5% by volume oxygen and water vapor but in the absence of a substantial quantity of liquid water;

d. thereby substantially reducing the amount of SO_x and NO_x in the gaseous mixture.

4,442,081

PROCESS FOR PRODUCING A STABILIZED PHOSPHORIC ACID

Roberto I. Morrell, and Charles F. Peters, both of Lakeland, Fla., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,257
Int. Cl.³ C01B *25/16, 15/16, 25/26;* C05B *11/00*
U.S. Cl. 423—321 R 5 Claims

1. A method for preparing wet process phosphoric acid having a P_2O_5 content of about 57 to 63 weight percent comprising:

(a) clarifying crude feed phosphoric acid in a clarifier, said phosphoric acid having a P_2O_5 content of about 26–36% P_2O_5;

(b) separating the clarified phosphoric acid portion from the settled solids;

(c) dissolving about 0.05 to 2.0 weight percent of an aluminum silicate material based on the total weight of P_2O_5 to the clarified phosphoric acid;

(d) concentrating the phosphoric acid to a P_2O_5 content of 38 to 42 weight percent;

(e) clarifying the concentrated phosphoric acid in a clarifier thereby causing solids to settle by gravity in the clarifier and separating a further clarified phosphoric acid from the settled solids;

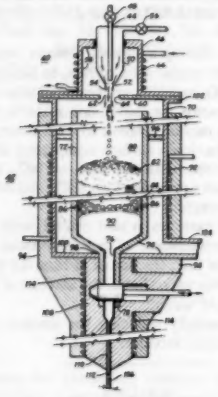
(f) concentrating the separated phosphoric acid to a P_2O_5 content of about 46 to 52 weight percent;
(g) crystallizing phosphate-containing solids and separating such solids from said phosphoric acid;
(h) concentrating the remaining phosphoric acid to a P_2O_5 content of 57 to 63 weight percent; and
(i) utilizing the solids from step (g) to prepare one or more by-products selected from the group consisting of diammonium phosphate and triple superphosphate.

4,442,082

PROCESS FOR OBTAINING SILICON FROM FLUOSILICIC ACID

Angel Sanjurjo, San Jose, assignor to SRI International, Menlo Park, Calif.

Filed Dec. 27, 1982, Ser. No. 453,456
Int. Cl.³ C01B *33/02*
U.S. Cl. 423—350 **13 Claims**



1. A process for producing low cost, high purity, solar grade silicon by reaction of gaseous silicon tetrafluoride with sodium in substantially stoichiometric quantities to produce a reaction product consisting essentially of sodium fluoride and silicon from which silicon is recovered and wherein said fluoride gas used in the reaction is obtained by thermal decomposition of sodium fluosilicate which is precipitated from aqueous fluosilicic acid generated from phosphate rock conversion to fertilizer, said process comprising:
(a) carrying out said reaction inside a reactor including a reaction chamber formed with perforations in ht walls thereof, said perforations being of a size such that essentially all of the molten sodium fluoride reaction product freely passes out through the perforations due to the low surface tension of sodium fluoride compared to silicon, and molted silicon is preferentialy contained in the reaction chamber;
(b) collecting said sodium fluoride reaction product passing through said perforations in said reaction chamber in a sodium fluoride product collection and dispensing chamber surrounding said reaction chamber; and
(c) removing the silicon reaction product remaining in the lower portion of said reaction chamber by free flow.

4,442,083

METHOD OF DESULFURIZING WASTE GASES CONTAINING SULFUR DIOXIDE

Manuel J. Canales, Orange, Conn., and John Reynolds, El Cerrito, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 4, 1982, Ser. No. 439,257
Int. Cl.³ C01B *17/00, 17/02*
U.S. Cl. 423—567 R **8 Claims**

1. A process for the removal of sulfur dioxide from a feed gas which comprises:
(a) absorbing the sulfur dioxide (SO_2) in an aqueous absorbent comprising soluble sulfite;
(b) stripping the absorbent from (a) which contains absorbed SO_2 to form a gas comprising SO_2 and wherein the absorbent is recycled back to the absorber from the stripper;
(c) absorbing the stripped SO_2 in a separate absorbent for the SO_2; and
(d) reacting the absorbed SO_2 from step (c) in a liquid Claus reactor thereby forming sulfur and wherein excess H_2S in the tail gas from the Claus reactor is incinerated to form SO_2 which is recycled to the Claus reactor.

4,442,084

ANALGESIC AND MYOTONOLYTIC PREPARATIONS

Dietmar Römer, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 296,910, Aug. 27, 1981, abandoned, which is a continuation of Ser. No. 224,086, Jan. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 138,229, Apr. 7, 1980, abandoned. This application Aug. 11, 1982, Ser. No. 407,153
Claims priority, application Switzerland, Apr. 10, 1979, 3411/79; Apr. 10, 1979, 3409/79
Int. Cl.³ A61K *31/425, 3/505*
U.S. Cl. 424—251 **19 Claims**

1. A pharmaceutical preparation in oral form useful in inducing analgesia and/or in treating myotonolytic conditions comprising: as active agent (a), an analgesically active quinazoline compound selected from the group consisting of
1-isopropyl-4-(4-fluorophenyl)-6,7-methylenedioxy-2(1H)-quinazolinone;
1-isopropyl-4-phenyl-7-methyl-2(1H)-quinazolinone;
1-isopropyl-4-phenyl-6,7-methylenedioxy-2(1H)-quinazolinone;
1-isopropyl-4-(4-fluorophenyl)-7-methyl-2-(1H)-quinazolinone;
1-cyclopropylmethyl-4-phenyl-6-methoxy-2(1H)-quinazolinone; and
1-(2,2,2-trifluoroethyl)-4-phenyl-6-chloro-2(1H)-quinazolinone, and
as active agent (b), a centrally acting myotonolytic compound selected from 5-chloro-7-methyl-4-(-imidazolin-2-ylamino)-2,1,3-benzothiadiazole and 5-chloro-4-(2-imidazolin-2-ylamino)-2,1,3-benzothiadiazole, said active agents (a) and (b) being present in the pharmaceutical preparation in a ratio of active agent (a) to active agent (b) of from about 5:1 to about 100:1 parts by weight.

4,442,085

PROTECTION AGAINST DENTAL CARIES

Geoffrey Colman, Sevenoaks, and Roy R. B. Russell, Bromley, both of England, assignors to The Secretary of State for Social Services in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 68,443, Aug. 21, 1979, abandoned. This application Jun. 15, 1982, Ser. No. 388,624

Claims priority, application United Kingdom, Sep. 1, 1978, 35383/78

Int. Cl.[3] A61K 7/16, 39/00, 39/09; C07G 7/00

U.S. Cl. 424—49 9 Claims

1. An antigen preparation for use in the reduction or prevention of dental caries wherein the antigenic proteins present in the preparation are derived from bacteria of the species *Streptococcus mutans* genetic group I and have the following properties:

(a) are present on the cell walls of *Streptococcus mutans* genetic group I,

(b) remain associated with the cell walls after boiling the cell walls with 10 gm/liter aqueous sodium dodecyl sulphate for 20 minutes,

(c) have a molecular weight of about 29,000 by SDS-polyacrylamide gel electrophoresis (SDS-PAGE),

(d) have an isoelectric point of about 4.1 to 4.5,

(e) are destroyed by proteolytic enzyme, and

(f) do not cross react with heart tissue.

3. A pharmacological preparation for use in the reduction or prevention of dental caries in a mammal comprising a nontoxic effective amount of an active component in a pharmacologically acceptable diluent or carrier, wherein said active component is an antigen preparation according to claim 1 or antibodies thereto.

4,442,086

DIETHYLCARBAMAZINE RESINATE AND STYRYLPYRIDINIUM RESINATE-DIETHYLCARBAMAZINE RESINATE EDIBLE ANTHELMINTIC TABLETS FOR COMPANION ANIMALS

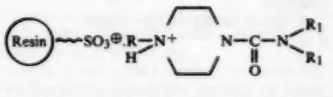
James M. Quinlan, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 60,931, Jul. 26, 1979, abandoned. This application Mar. 3, 1981, Ser. No. 239,966

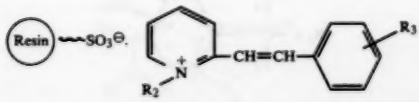
Int. Cl.[3] A61K 31/74

U.S. Cl. 424—79 4 Claims

1. A palatable anthelmintic resinate composition comprising from 2% to 5% by weight of a resinated N,N-dialkylpiperazine carboxamide compound having the structural formula:



where R is hydrogen or alkyl C_1–C_6 and R_1 is alkyl C_1–C_5 and wherein the resin is a high capacity sulfonic cationic exchange resin of the polystyrene-divinylbenzene type having a particle size of less than 800μ; from 0 to 7% by weight of a resinated styrylpyridinium compound having the structural formula:



wherein R_2 is alkyl C_1–C_4, R_3 is hydrogen or halogen and the resin is a high capacity sulfonic cationic exchange resin of the polystyrene-divinylbenzene type having a particle size of less than 800μ; 18% to 60% by weight of desiccated liver; 0 to 40% by weight of Brewer's yeast; 23.95% to 31% by weight of microcrystalline cellulose, 0% to 7% by weight of stearic acid; and 0% to 0.05% by weight of sodium aluminum silicate or silicon dioxide.

4,442,087

INTERFERON INDUCER, A PROCESS FOR PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Yasuhiko Kojima, Yokohama; Seishi Kono; Sadao Tamamura, both of Tokyo; Takashi Hashimoto, Chofu, and Nobuyuki Shibukawa, Tokyo, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,468

Claims priority, application Japan, Dec. 10, 1979, 54/160089

Int. Cl.[3] A61K 31/69, 39/00, 45/02

U.S. Cl. 424—85 15 Claims

1. A process for producing a water-soluble interferon inducer from a plant tissue, comprising extracting said interferon inducer with water from the tissue of a plant belonging to the genus Artemisia containing said interferon inducer at a temperature of from ambient to the boiling point of the extraction mixture for a period of up to 5 days sufficient to extract the major portion of said interferon inducer present in said tissue, forming a supernatant from the extracted solution, fractionating the supernatant to yield fractions containing the major portion of said interferon inducer present in the supernatant, and recovering said interferon inducer therefrom.

4,442,088

TUMOR ENZYME DETECTION

A. Robin Poole, Baie d' Urfe; John S. Mort, and Anneliese D. Recklies, both of Point Claire, Canada, assignors to Shriners Hospitals for Crippled Children, Tampa, Fla.

Filed Sep. 29, 1981, Ser. No. 307,085

Int. Cl.[3] A61K 39/00

U.S. Cl. 424—85 6 Claims

1. The process of producing a monospecific antiserum to cathepsin B proteinase secreted by malignant tumors comprising essentially the steps of:

(a) producing a proteinase emulsion by homogenizing purified cathepsin B proteinase after dialyzing to remove ampholines, said cathepsin B proteinase having a molecular weight of about 36,000 and being stable under alkaline pH conditions;

(b) injecting the proteinase emulsion intramuscularly into an animal;

(c) reinjecting the animal with the proteinase emulsion;

(d) withdrawing blood of the animal after sufficient time elapses for antibody production; and

(e) isolating the monospecific antiserum from the blood.

4,442,089

METHOD FOR TREATING GLAUCOMA WITH TOPICAL OR SYSTEMIC ACE INHIBITOR COMPOSITIONS

Zola P. Horovitz, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 6, 1982, Ser. No. 395,542

Int. Cl.[3] A61K 37/00, 31/675, 31/66, 31/40

U.S. Cl. 424—177 14 Claims

1. A method for treating glaucoma or lowering intraocular pressure in a mammalian species, which comprises topically or systemically administering an effective amount of an angiotensin converting enzyme inhibitor selected from the group consisting of a substituted proline derivative, a carboxyalkyl dipeptide derivative, a phosphinylalkanoyl proline derivative, and a phosphonamidate derivative.

4,442,090

ABSORPTION-PROMOTING COMPOUNDS, COMPOSITIONS THEREOF WITH PHARMACEUTICALS AND/OR BASES FOR RECTAL ADMINISTRATION AND METHOD OF USE

Nobuharu Kakeya, Nagaokakyo; Kazuhiko Kitao, and Ken-ichi Nishimura, both of Kyoto, all of Japan, assignors to Kyoto Yakuhin Kogyo Kabushiki Kaisha, Japan

Filed Mar. 24, 1981, Ser. No. 246,953

Claims priority, application Japan, Nov. 14, 1980, 55-161121; Nov. 19, 1980, 55-157170

Int. Cl.³ A61K *37/26, 37/00, 31/54, 31/425*

U.S. Cl. 424—178 10 Claims

1. A combination of (I) a physiologically-acceptable pharmacologically-active substance, which is rectally unabsorbable into the bloodstream or rectally absorbable into the bloodstream to an inadequate degree or only with difficulty, with (II) at least one physiologically-acceptable compound which is an N-acylamino acid having at least 9 carbon atoms, the acyl moiety having from 2 to 18 carbon atoms, and which:

(A) has a log P value in the range of from 2.5 to 6,

(B) has at least one carboxyl group in its molecular structure,

(C) has a carboxyl-group pKa value of at least 2.5, and

(D) is free from halogen atoms,

or a nontoxic salt thereof;

the amount of (II) being sufficient to promote absorption of (I) from the rectum into the bloodstream.

4,442,091

PROCESS FOR COMBATTING AND/OR PREVENTING ALLERGIC DISEASES EMPLOYING NATAMYCIN

Philippe Lebrun, La-Neuve, and Daniele de Saint Georges-Gridelet, Geel, both of Belgium, assignors to Gist-Brocades N.V., Delft, Netherlands

PCT No. PCT/NL81/00024, 371 Date Apr. 29, 1982, 102(e) Date Apr. 29, 1982, PCT Pub. No. WO82/00750, PCT Pub. Date Mar. 18, 1982

PCT Filed Aug. 28, 1981, Ser. No. 377,205

Claims priority, application Netherlands, Aug. 29, 1980, 8004949

Int. Cl.³ A01N *63/02*

U.S. Cl. 424—181 6 Claims

1. A method of combatting house-dust mites comprising contacting house-dust mites with a miticidally effective amount of natamycin.

4,442,092

SESAME NEMATOCIDAL COMPOSITION

Bob W. McBrayer, P.O. Box 128, Dixon, Calif. 95620

Filed Apr. 19, 1982, Ser. No. 369,623

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195 10 Claims

1. A method for killing nematodes comprising treating soil infested with nematodes with a nematocidally effective amount of a composition containing as active nematocidal ingredients of at least one or more of the following total sesame plant meal or the extracts thereof or concentrate of the extract of the sesame plant meal.

4,442,093

METHOD FOR ADMINISTERING 24,25-DIHYDROXYCHOLECALCIFEROL TO PERSONS SUFFERING FROM HYPERCALCEMIA

Yuji Maeda, Matsudo; Takayoshi Fujii, Tokyo; Yasuhiko Kobayashi, Tokyo; Kenichi Saito, Tokyo; Tadaaki Kato, Tokyo, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,702

Claims priority, application Japan, May 15, 1981, 56-73264; Dec. 9, 1981, 56-198015; Dec. 9, 1981, 56-198016; Feb. 8, 1982, 57-18600; Apr. 15, 1982, 54-62688; Apr. 20, 1982, 54-65869; Apr. 27, 1982, 54-70682

Int. Cl.³ A61K *31/59*

U.S. Cl. 424—236 4 Claims

1. A method for treating hypercalcemia, ulcer, reduced immune function, metabolic abnormality on magnesium, hyperphosphatemia, abnormality on blood sugar or tumour, which comprises administering to a human or an animal suffering therefrom a therapeutically effective amount of a compound selected from the group consisting of 24R,25-dihydroxycholecalciferol, 24S,25-dihydroxycholecalciferol and a mixtures thereof.

2. The method according to claim 1, wherein the compound is 24R,25-dihydroxycholecalciferol.

4,442,094

(3-ARALKYLAMINO-2-OR-PROPOXY)HETEROCYCLIC COMPOUNDS

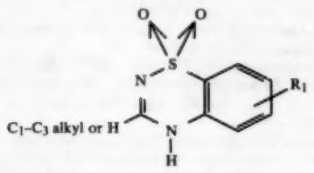
Joseph G. Atkinson, Montreal, Canada; John J. Baldwin, Gwynedd Valley, and David E. McClure, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 219,726, Dec. 23, 1980, Pat. No. 4,349,673. This application Feb. 22, 1982, Ser. No. 350,922

Int. Cl.³ C07D *285/24;* A61K *31/54*

U.S. Cl. 424—246 14 Claims

1. A compound of the formula:



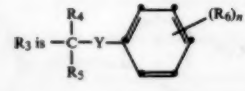
individual isomers and pharmaceutically acceptable salts thereof wherein

R_1 is $-OCH_2-CHOR_2-CH_2-NHR_3$

R_2 is H or

wherein

L is phenyl or C_1–C_5 alkyl and

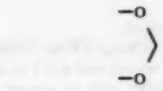


wherein

R_4 and R_5 are independently selected from H and C_1–C_3alkyl,

Y is CH_2, $(CH_2)_2$ or $-CH_2O-$

R_6 is H, OH, OCH_3, halogen, C_1–C_3alkyl or



and n is 1 or 2.

14. A method for reducing intraocular pressure in a patent in need of such treatment which comprises administering to such patient an intraocular pressure reductive amount of a compound of claim **1**.

4,442,095

N-[(5-HALO-2,6-(SUBSTITUTED)PYRAZINYL)METHYLENE]AMINE ANTIMICROBIAL COMPOUNDS, COMPOSITIONS AND USE

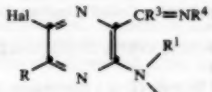
David B. R. Johnston, Warren, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 27, 1982, Ser. No. 453,056

Int. Cl.[3] **A01N** *43/60, 43/84;* **C07D** *241/20, 413/04*

U.S. Cl. 424—248.5 **14 Claims**

1. A compound of the formula:



(I.)

wherein:

Hal is bromine or chlorine; and

R is halo; mono- or di-substituted mono- or diloweralkylamino wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; 4-morpholino; thiocyano; mercapto; straight or branched chain C_{1-8}alkylthio; mono- or di-substituted loweralkylthio wherein the substituents are hydroxy, amino, loweralkylanoylamino, or loweralkoxycarbonyl; arylthio; loweralkylsulfoxy; or loweralkylsulfonyl;

R^1 is hydrogen; or loweralkyl;

R^2 is $(CH_2)_nCOOR^a$, where R^a is hydrogen, loweralkyl, or benzyl; and n is 1 to 3;

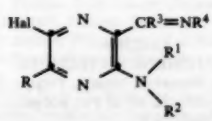
R^1 and

R^2 are taken together with an oxygen or nitrogen atom to form morpholino, piperazinyl, or piperazinyl which is N-loweralkyl substituted;

R^3 is hydrogen; straight or branched C_{1-8} alkyl; aryl; aryl substituted with up to two members selected from the group consisting of C_{1-3}alkyl, C_{1-3}alkoxy, halo, and mono- or di-C_{1-3}alkyl substituted amino; heteroaryl; formylC_{2-4}alkenyl; or C_{2-4}alkenyl; and

R^4 is straight or branched C_{1-8}alkyl; loweralkoxy; hydroxy; loweralkoxycarbonylmethyl; benzyl; or benzyl substituted with up to two members selected from the group consisting of halo, loweralkyl, and loweralkoxy.

5. A method of inhibiting the growth of bacteria and fungi comprising contacting said bacteria and fungi with a bactericidally and fungicidally effective amount of a compound of the formula:



(I.)

wherein:

Hal is bromine or chlorine; and

R is halo; mono- or di-substituted mono- or diloweralkylthio wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; 4-morpholino; thiocyano; mercapto; straight or branched chain C_{1-8}alkylthio; mono- or di-substituted loweralkylthio wherein the substituents are hydroxy, amino, loweralkanoylamino, or loweralkoxycarbonyl; arylthio; loweralkylsulfoxy; or loweralkylsulfonyl;

R^1 is hydrogen; or loweralkyl;

R^2 is $(CH_2)_nCOOR^a$, where R^a is hydrogen, loweralkyl, or benzyl; and n is 1 to 3;

R^1 and

R^2 are taken together with an oxygen or nitrogen atom to form morpholino, piperazinyl, or piperazinyl which is N-loweralkyl substituted;

R^3 is hydrogen; straight or branched C_{1-8} alkyl; aryl; aryl substituted with up to two members selected from the group consisting of C_{1-3}alkyl, C_{1-3}alkoxy, halo, and mono- or di-C_{1-3}alkyl substituted amino; heteroaryl; formylC_{2-4}alkenyl; or C_{2-4}alkenyl; and

R^4 is straight or branched C_{1-8}alkyl; loweralkoxy; hydroxy; loweralkoxycarbonylmethyl; benzyl; or benzyl substituted with up to two members selected from the group consisting of halo, loweralkyl, and loweralkoxy.

4,442,096

2-(SUBSTITUTED)AMINO-3-CYANO-5-HALO-6-(SUBSTITUTED)-PYRAZINE ANTIMICROBIAL COMPOUNDS, COMPOSITIONS AND USE

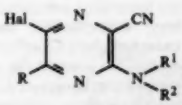
David B. R. Johnston, Warren, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 27, 1982, Ser. No. 453,057

Int. Cl.[3] **A01N** *43/60, 43/84;* **C07D** *241/20, 413/04*

U.S. Cl. 424—248.5 **14 Claims**

1. A compound of the formula:



(I.)

wherein:

Hal is bromine or chlorine; and

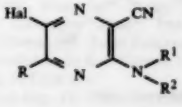
R is halo; mono- or di-substituted mono- or diloweralkylamino wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; 4-morpholino; thiocyano; mercapto; straight or branched chain C_{1-8}alkylthio; mono- or di-substituted loweralkylthio wherein the substituents are hydroxy, amino, loweralkanoylamino, or loweralkoxycarbonyl; arylthio; loweralkylsulfoxy; or loweralkylsulfonyl;

R^1 is hydrogen; or loweralkyl;

R^2 is $(CH_2)_nCOOR^3$, where R^3 is hydrogen, loweralkyl, or benzyl; and n is 1 to 3; and

R^1 and R^2 are taken together with an oxygen or nitrogen atom to form morpholino, piperazinyl, or piperazinyl which is N-loweralkyl substituted.

5. A method of inhibiting the growth of bacteria and fungi comprising contacting said bacteria and fungi with a bactericidally and fungicidally effective amount of a compound of the formula:



(I.)

wherein:

Hal is bromine or chlorine; and

R is halo; mono- or di-substituted mono- or diloweralkylamino wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; 4-morpholino; thiocyano; mer-

capto; straight or branched chain C_{1-8}alkylthio; mono- or di-substituted loweralkylthio wherein the substituents are hydroxy, amino, loweralkanoylamino, or loweralkoxycarbonyl; arylthio; loweralkylsulfoxy; or loweralkylsulfonyl;

R^1 is hydrogen; or loweralkyl;

R^2 is $(CH_2)_nCOOR^3$, where R^3 is hydrogen, loweralkyl, or benzyl; and n is 1 to 3; and

R^1 and R^2 are taken together with an oxygen or nitrogen atom to form morpholino, piperazinyl, or piperazinyl which is N-loweralkyl substituted.

4,442,097

3-ACYL-2-(SUBSTITUTED) AMINO-5-HALO-6-(SUBSTITUTED) PYRAZINE ANTIMICROBIAL COMPOUNDS, COMPOSITIONS AND USE

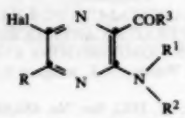
David B. R. Johnston, Warren, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 27, 1982, Ser. No. 453,058

Int. Cl.[3] **A01N** *43/60, 43/84;* **C07D** *241/20, 413/04*

U.S. Cl. 424—248.5 **14 Claims**

1. A compound of the formula:



(I.)

wherein:

Hal is bromine or chlorine; and

R is halo; mono- or di-substituted mono- or diloweralkylamino wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; 4-morpholino; thiocyano; mercapto; straight or branched chain C_{1-8}alkylthio; mono- or di-substituted loweralkylthio wherein the substituents are hydroxy, amino, loweralkanoylamino, or loweralkoxycarbonyl; arylthio; loweralkylsulfoxy; or loweralkylsulfonyl;

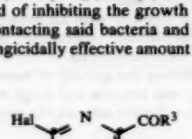
R^1 is hydrogen; or loweralkyl;

R^2 is hydroxyloweralkyl; $(CH_2)_nCOOR^a$, where R^1 is hydrogen, loweralkyl, or benzyl; and n is 1 to 3;

R^1 and R^2 are taken together with an oxygen or nitrogen atom to form morpholino, piperazinyl, or piperazinyl which is N-loweralkyl substituted; and

R^3 is hydrogen; straight or branched C_{1-8} alkyl, provided that when R^3 is hydrogen or C_{1-8} alkyl, R is other than halo; aryl; aryl substituted with up to two members selected from the group consisting of C_{1-3}alkyl, C_{1-3}alkoxy, halo, and mono- or di-C_{1-3}alkyl substituted amino; heteroaryl; formyl C_{2-4}alkenyl; or C_{2-4}alkenyl.

5. A method of inhibiting the growth of bacteria and fungi comprising contacting said bacteria and fungi with a bactericidally and fungicidally effective amount of a compound of the formula.



(I.)

wherein:

Hal is bromine or chlorine; and

R is halo; mono- or di-substituted mono- or diloweralkylamino wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; 4-morpholino; thiocyano; mercapto; straight or branched chain C_{1-8}alkylthio; mono-or-disubstituted loweralkylthio wherein the substituents are hydroxy, amino, loweralkanoylamino, or loweralkoxycarbonyl; arylthio; loweralkylsulfoxy; or loweralkylsulfonyl;

R^1 is hydrogen; or loweralkyl;

R^2 is hydroxyloweralkyl; $(CH_2)_nCOOR^1$, where R^a is hydrogen, loweralkyl, or benzyl; and n is 1 to 3;

R^1 and R^2 are taken together with an oxygen or nitrogen atom to form morpholino, piperazinyl, or piperazinyl which is N-loweralkyl substituted; and

R^3 is hydrogen; straight or branched C_{1-8} alkyl, provided that when R^3 is hydrogen or C_{1-8} alkyl, R is other than halo; aryl; aryl substituted with up to two members selected from the group consisting of C_{1-3}alkyl, C_{1-3}alkoxy, halo, and mono- or di-C_{1-3}alkyl substituted amino; heteroaryl; formyl C_{2-4}alkenyl; or C_{2-4}alkenyl.

4,442,098

PENTACYCLIC DERIVATIVES OF PIPERAZINE

Derek V. Gardner, Bishop Stortford, and Laramie M. Gaster, Sawbridgeworth, both of England, assignors to Beecham Group Limited, England

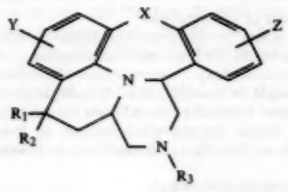
Filed Dec. 18, 1981, Ser. No. 332,347

Claims priority, application United Kingdom, Dec. 31, 1980, 8041558

Int. Cl.[3] **C07D** *471/06, 498/06, 513/06;* **A61K** *31/495*

U.S. Cl. 424—248.51 **8 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein:

X is CH_2, O, S or NR wherein R is hydrogen or C_{1-4} alkyl;

Y and Z are independently selected from hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, halogen or CF_3;

R_1 is hydrogen, C_{1-6} alkyl, phenyl or phenyl-C_{1-4} alkyl any of which phenyl moieties may be substituted by one or more of C_{1-6} alkyl, C_{1-6} alkoxy, halogen or CF_3;

R_2 is hydrogen, OH, C_{1-6} alkoxy, phenyl-C_{1-4} alkoxy, C_{1-7} acyloxy or NR_4R_5 wherein R_4 and R_5 are independently selected from hydrogen or C_{1-6} alkyl; R_4 is hydrogen and R_5 is OH or C_{1-4} alkoxy; or R_4 and R_5 together form C_{3-6} polymethylene optionally interrupted by one O or one NR_6 where R_6 is hydrogen or C_{1-4} alkyl; or together with R_1 forms an oxo group or $=NOR_7$ wherein R_7 is hydrogen or C_{1-6} alkyl; and

R_3 is hydrogen or C_{1-6} alkyl.

4,442,099

LEUKOTRIENE ANALOGUES

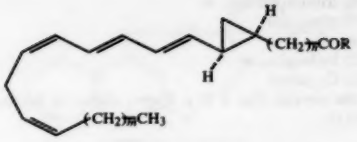
Kyriacos C. Nicolaou, Haverton; Nicos A. Petasis, and Steven P. Seitz, both of Philadelphia, all of Pa., assignors to Research Corporation, New York, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,553

Int. Cl.[3] **C07C** *69/743, 103/737;* **A61K** *31/215, 31/16*

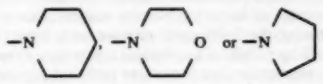
U.S. Cl. 424—248.57 **20 Claims**

1. A compound of the formula

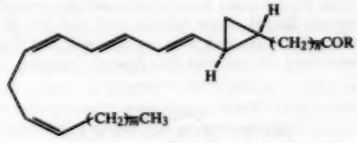


wherein n is an integer from 2 to 4; m is an integer from 3 to 5; R is OM, OR_1 or NR_2R_3 where M is a pharmaceutically acceptable cation;

R_1, R_2 and R_3 are the same or different and selected from the group consisting of: hydrogen; C_1–C_{12} branched, unbranched or cyclic alkyl; phenyl, lower-alkyl substituted phenyl, halo-substituted phenyl and combinations thereof; and benzyl, lower alkyl substituted benzyl, and halo-substituted benzyl; or R_2 and R_3 taken together form a group of the formula:



10. A pharmaceutical composition comprising an amount sufficient to inhibit the lipoxygenase pathway of arachidonic acid metabolism of a compound of the formula:



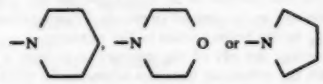
wherein n is an integer from 2 to 4;

n is an integer from 3 to 5;

R is OM, OR_1 or NR_2R_3

where M is a pharmaceutically acceptable cation;

R_1, R_2 and R_3 are the same or different and selected from the group consisting of: hydrogen; phenyl, lower-alkyl substituted phenyl, halo-substituted phenyl and combinations thereof; and benzyl, lower alkyl substituted benzyl and halo-substituted benzyl; or R_2 and R_3 taken together form a group of the formula:



together with an inert pharmaceutical carrier.

4,442,100

SUBSTITUTED 2-AMINO-3,4-DIHYDROPYRIDINE DERIVATIVES, THEIR PRODUCTION AND THEIR MEDICINAL USE

Horst Meyer; Rüdiger Sitt; Günter Thomas, all of Wuppertal; Benward Garthoff, Hilden; Robertson Towart, and Ulrich Rosentreter, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

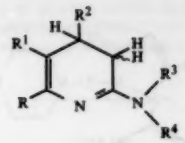
Filed Nov. 24, 1980, Ser. No. 210,119

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2949701; May 2, 1980, 3016874

Int. Cl.³ A61K *31/495*; **C07D** *241/04, 401/04*

U.S. Cl. 424—250 **14 Claims**

1. A compound of the formula



(I)

in which R represents a hydrogen atom, a straight-chain or branched alkyl radical which has up to 6 carbon atoms and is optionally mono-substituted or di-substituted by alkoxy with 1 to 4 carbon atoms, dialkylamino with 1 to 4 carbon atoms in each alkyl group, or a phenyl or benzyl radical, the phenyl ring thereof optionally being mono-substituted or di-substituted by identical or different substituents selected from fluorine, chlorine, bromine and alkyl and alkoxy with in each case 1 to 4 carbon atoms, R^1 and R^2 are identical or different and each represent a phenylnaphthyl or pyridyl radical, these aromatic rings optionally containing 1 or 2 identical or different substituents selected from cyano, hydroxyl, carboxyl, halogen, phenyl, alkyl, alkoxy, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, alkylmercapto, alkylsulphonyl and alkylamino, and the alkyl and alkoxy radicals mentioned each containing 1 to 4 carbon atoms, and R^3 and R^4 together with a nitrogen atom to which they are attached, form a piperazino ring, which is optionally substituted at the 4-nitrogen atom by an R^6 group

in which R^6 has a meaning indicated above in the definition of R^1 and R^2.

3. A pharmaceutical composition containing as an active ingredient an antilipidemically effective amount of a compound according to claim 1, in admixture with an inert pharmaceutical carrier.

4,442,101

SESQUIHYDRATE OF NAPHTHYRIDINE DERIVATIVE, AND PROCESS FOR THE PREPARATION THEREOF

Hitoshi Ichihashi, Kyoto; Terukazu Tanaka, Osaka, and Yu Imasato, Toyonaka, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan and Laboratoire Roger Bellon, Neuilly sur Seine, France

Filed Feb. 4, 1982, Ser. No. 345,916

Claims priority, application Japan, Feb. 13, 1981, 56-20749

Int. Cl.³ C07D *487/04*; **A61K** *31/495*

U.S. Cl. 424—250 **11 Claims**

1. 1-Ethyl-6-fluoro-1,4-dihydro-4-oxo-7-(1-piperazinyl)-1,8-naphthyridine-3-carboxylic acid.sesquihydrate.

11. An antibacterial composition comprising as an active ingredient an antibacterially effective amount of the sesquihydrate defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4,442,102

1,5-DIPHENYLPYRAZOLIN-3-ONE COMPOUNDS, PROCESS AND INTERMEDIATES FOR PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Henning Heinemann, Hanover, Fed. Rep. of Germany; Daniel Jasserand, Paris, France; Wolfgang Milkowski, Burgdorf, Fed. Rep. of Germany; Dimitri Yavordios, Chatillon-sur-Chalaronne, France, and Horst Zeugner, Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

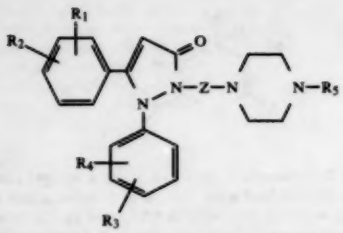
Filed Aug. 19, 1982, Ser. No. 409,631

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132915

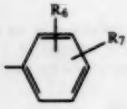
Int. Cl.³ C07D *403/06, 231/08*; **A61K** *31/495*

U.S. Cl. 424—250 **5 Claims**

1. A 1,5-diphenylpyrazolin-3-one compound of the formula I



where R_1 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy, hydroxyl, trifluoromethyl or lower alkanoyloxy, R_2 is a hydrogen or halogen atom, or a lower alkyl or lower alkoxy, or R_1 and R_2 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy, R_3 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy, hydroxy, trifluoromethyl or lower alkanoyloxy, R_4 is a hydrogen or halogen atom, or a lower alkyl or lower alkoxy, or R_3 and R_4 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy, Z is an alkylene with 2 to 6 carbon atoms, and R_5 is an unsubstituted pyridyl, a pyridyl which is monosubstituted by a halogen atom, or a lower alkyl or lower alkoxy, a thienyl or an unsubstituted or substituted phenyl a



a

where R_6 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy, hydroxyl, trifluoromethyl or lower alkanoyloxy, and R_7 is a hydrogen or halogen atom, or a lower alkyl or lower alkoxy, or R_6 and R_7 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy; and acid addition salts thereof.

4,442,103

TREATING SEDATION WITH 1-(3-SUBSTITUTED-2-PYRIDINYL) PIPERAZINES

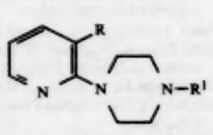
Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 267,326, May 26, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,914

Int. Cl.³ A61K *31/495*

U.S. Cl. 424—250 **4 Claims**

1. A method of treating sedation caused by presynaptic α_2-adrenergic receptor stimulation by antihypertensive drug therapy in a patient in need of such treatment which comprises the administration of 0.01 to 20 mg/kg/day of a compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein:

R is

(1) hydrogen;

(2) halo;

(3) C_{1-4}alkyl;

(4) cyano;

(5) C_{1-4}alkoxy;

(6) trifluoromethyl; or

(7) nitro; and

R^1 is

(1) hydrogen, or

(2) C_{1-3}alkyl;

with the proviso that if R is fluoro, chloro or bromo, R^1 is C_{1-3}alkyl.

4,442,104

COLORING OF FRUIT

Elaine R. Wedral, Brookfield; Richard M. Hopefl, and Rufus A. Ivie, both of New Milford, all of Conn., assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jan. 4, 1983, Ser. No. 455,597

Int. Cl.³ A23L *1/275, 1/212*

U.S. Cl. 426—250 **10 Claims**

1. A process for artificially colouring fruit which comprises:

(a) combining a pale-coloured fruit with from 0.5 to 4.0 parts by weight of water per part by weight of the fruit;

(b) treating the fruit/water mixture with from 0.001% to 1.00% by weight of a colourant comprising a food acceptable pigment or dye containing carboxyl groups based on the weight of the fruit and with an effective amount of a hydrolysable tannin sufficient to fix the colourant in the fruit at a temperature of from 15° C. to the boiling point of the mixture;

(c) lowering the pH of the mixture to at least a value at which the colourant becomes substantially insoluble;

(d) raising the pH of the mixture such that the pH of the inner parts of the fruit does not exceed 7; and then

(e) separating the coloured fruit from the mixture.

4,442,105

FRUIT COLORING PROCESS

Ulrich Wissgott, La Tour-de-Peilz, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jan. 4, 1983, Ser. No. 455,599

Int. Cl.³ A23L *1/275, 1/212*

U.S. Cl. 426—250 **10 Claims**

1. A process for artificially colouring fruit which comprises:

(a) combining a pale-coloured fruit with from 0.5 to 4.0 parts by weight of water per part by weight of the fruit;

(b) treating the fruit/water mixture with from 0.001% to 0.100% by weight of a food acceptable dye containing carboxyl groups based on the weight of the fruit and with an effective amount of an edible calcium salt sufficient to fix the dye in the fruit at an elevated temperature of from 80° C. to the boiling point of the mixture;

(c) lowering the pH of the mixture to at least a value at which the colourant becomes substantially insoluble;

(d) raising the pH of the mixture such that the pH of the inner parts of the fruit does not exceed 7; and then

(e) separating the coloured fruit from the mixture.

4,442,106

QUINOLINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING SUCH COMPOUNDS, AND METHODS OF TREATING CARDIOVASCULAR CONDITIONS WITH THEM

Hans B. Trijzelaar, Zeist; Ronus de Bode, Bilthoven, and Hendricus B. A. Welle, Maarssen, all of Netherlands, assignors to Acf Chemiefarma N.V., Netherlands

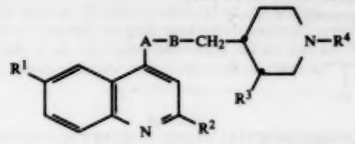
Filed Mar. 5, 1981, Ser. No. 240,808

Claims priority, application Netherlands, Mar. 6, 1980, 8001369

Int. Cl.³ A61K *31/47;* **C07D** *401/06*

U.S. Cl. 424—258 **31 Claims**

1. A compound of formula 1, or a salt thereof,



in which

A—B is —CH_2—CH_2—, —CHOH—CH_2—, —CH_2—CHOH—, —C(O)—CH_2—, —CH_2—C(O)—, —C(NOR^5)—CH_2—or —CH_2—C(NOR^5)—,

R^1 is hydrogen, hydroxy or lower alkoxy,

R^2 is lower alkyl, hydroxy, lower alkoxy, or CF_3,

R^3 is ethyl or vinyl,

R^4 is C_{1-9} alkyl, C_{2-9} hydroxyalkyl or lower alkoxyalkyl, C_{5-6} cycloalkyl, C_{3-6} cycloalkyl lower alkyl, cyano lower alkyl, lower alkenyl, lower alkynyl, tetrahydrofurfuryl, mono- or di-lower alkylamino lower alkyl; mono- or di-lower alkylamino lower hydroxyalkyl; phenyl C_{1-4} alkyl, phenyl C_{1-4} hydroxyalkyl, diphenyl C_{1-4} alkyl, or benzoyl C_{1-4} alkyl, in which the phenyl moiety is unsubstituted or substituted by one substituent selected from halogen, lower alkyl or lower alkoxy; furyl C_{1-4} alkyl, thienyl C_{1-4} alkyl, furoyl C_{1-4} alkyl or thienoyl C_{1-4} alkyl, and

R^5 is lower alkyl,

whereby the substituents at the 3- and 4-positions of the piperidine ring are in the cis-configuration.

19. A pharmaceutical composition comprising a cardiovascularly effective amount of a compound according to claim 1, or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier.

20. The method of treating cardiovascular conditions in a human or other animal in need thereof which comprises administering an effective amount of a compound according to claim 1.

4,442,107

QUINOLINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING SUCH COMPOUNDS, AND METHODS FOR TREATING CARDIOVASCULAR CONDITIONS WITH THEM

Hans B. Trijzelaar, Zeist; Ronus de Bode, Bilthoven, and Hendricus B. A. Welle, Maarssen, all of Netherlands, assignors to ACF Chemiefarma N.V., Netherlands

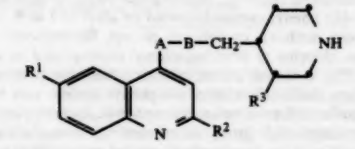
Filed Mar. 5, 1981, Ser. No. 240,818

Claims priority, application Netherlands, Mar. 6, 1980, 8001369; Jul. 11, 1980, 8004003

Int. Cl.³ A61K *31/47*; C07D *401/06*

U.S. Cl. 424—258 **14 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof in which

A–B is —CH_2—CH_2—, —CHOH—CH_2—, —CH_2—CHOH—, —C(O)—CH_2—, —CH_2—C(O)—, —C(NOR^4)—CH_2— or —CH_2—C(NOR^4)—,

R^1 is hydrogen, hydroxy or lower alkoxy,

R^2 is hydroxy, lower alkoxy or trifluoromethyl,

R^3 is ethyl or vinyl, and

R^4 is lower alkyl,

in which the configuration of the substituents in the 3- and 4-position of the depicted piperidine ring is cis.

14. The method of treating cardiovascular conditions in a human or other animal in need thereof which comprises administering an effective amount of a compound according to claim 1.

4,442,108

HYDROGENATED ISOQUINOLINES AND PERIPHERAL VASCULAR DISEASE TREATING COMPOSITIONS THEREOF

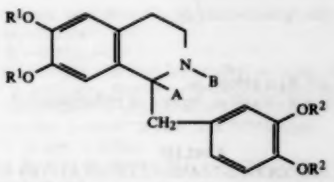
Jean-Bernard Le Polles, Rennes; Michel Martin, Saint-Gregoire; Guy Nadler, Rennes, and Edmond Saias, Issy-les-Moulineaux, all of France, assignors to Laboratoires Sobio S.A. of Immeuble Perisud, France

Continuation of Ser. No. 196,322, Oct. 14, 1980, abandoned, which is a continuation of Ser. No. 898,145, Apr. 20, 1978, abandoned. This application Sep. 10, 1981, Ser. No. 300,957

Int. Cl.³ C07D *215/14*; A61K *31/47*

U.S. Cl. 424—258 **7 Claims**

1. A compound of the formula



(II)

or a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 are different and one is alkyl of 1 to 6 carbon atoms and the other is isopropyl, and A and B together represent a covalent bond.

7. A pharmaceutical composition for the treatment of peripheral vascular disease which comprises from 50 to 500 mg of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

4,442,109

3-METHYLTHIOMETHYL-AND 3-METHYLSULFINYLMETHYL-4-QUINOLINONES USEFUL FOR TREATING HYPERTENSION

Roy V. Davies, Sutton-in-Ashfield, England, assignor to The Boots Company Limited, Nottingham, England

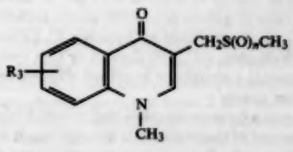
Filed Sep. 21, 1981, Ser. No. 303,948

Claims priority, application United Kingdom, Sep. 26, 1980, 8031106; Sep. 26, 1980, 8031162; Jun. 19, 1981, 8118879; Jun. 19, 1981, 8119062

Int. Cl.³ A61K *31/47*; C07D *215/22*

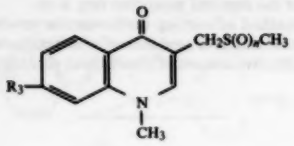
U.S. Cl. 424—258 **16 Claims**

1. A quinolone of the formula



wherein n is 0 or 1 and R_3 is hydrogen, 7-chloro, 7-fluoro, 7-trifluoromethyl, 6-fluoro, 7-methyl, or 7-bromo.

9. Therapeutic compositions which comprise an antihypertensive effective amount of a quinolone of the formula

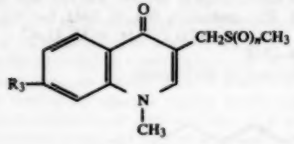


wherein

(a) n is 0 and R_3 is chloro, or

(b) n is 1 and R_3 is chloro, bromo, or trifluoromethyl.

16. A method of treating hypertension in a hypertensive mammal which comprises administering to the hypertensive mammal a therapeutically effective amount of a quinolone of the formula



wherein

(a) n is 0 and R_3 is chloro, or

(b) n is 1 and R_3 is chloro, bromo, or trifluoromethyl.

4,442,110

1H-1,2,4-TRIAZOLE-3,5-DIAMINE DERIVATIVES AND USE AS SELECTIVE HISTAMINE H_2-ANTAGONISTS

John W. Clitherow; John Bradshaw, both of Ware; John W. M. Mackinnon, Royston; Barry J. Price, Hertford; Michael Martin-Smith, Dane End, Near Ware, and Duncan B. Judd, Ware, all of England, assignors to Glaxo Group Limited, London, United Kingdom

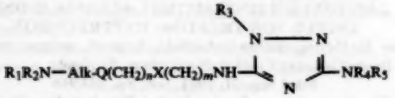
Division of Ser. No. 33,508, Apr. 26, 1979, Pat. No. 4,318,913. This application Nov. 24, 1981, Ser. No. 324,440

Claims priority, application United Kingdom, Apr. 26, 1978, 16468/78; Dec. 8, 1978, 47689/78; Mar. 2, 1979, 7907422

Int. Cl.[3] **A01N** *43/64;* **C07D** *249/14*

U.S. Cl. 424—263 **21 Claims**

1. A compound of the formula (I)



and physiologically acceptable acid addition salts thereof, in which

R_1 and R_2, which may be the same or different, each represent hydrogen, C_{1-10} alkyl, C_{3-8} cycloalkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, arC_{1-6}alkyl, wherein the aryl portion is phenyl or phenyl substituted with one or more C_{1-3} alkyl or C_{1-3} alkoxy groups or halogen atoms; trifluoroC_{1-6}alkyl or C_{1-6} alkyl substituted by hydroxy, C_{1-6} alkoxy, amino, C_{1-6} alkylamino, diC_{1-6}alkylamino or C_{3-8} cycloalkyl;

Alk represents a straight or branched alkylene chain of 1 to 6 carbon atoms;

Q represents a furan or thiophen ring in which incorporation into the rest of the molecule is through bonds at the 2- and 5-positions, the furan ring optionally bearing a further substituent R_7 adjacent to the group R_1R_2N—Alk—, or Q represents a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1- and 3- or 1- and 4-positions;

R_7 represents halogen or C_{1-4} alkyl which may be substituted by hydroxy or C_{1-4} alkoxy;

X represents —CH_2—,

—O— or —S—

where

R_6 represents hydrogen or methyl;

n represents zero, 1 or 2;

m represents 2, 3 or 4;

R_3 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, phenyl C_{1-6} alkyl, hydroxyalkyl having from two to six carbon atoms, C_{1-6} alkoxyC_{1-6}alkyl, phenyl or phenyl substituted with one or more C_{1-3} alkyl or C_{1-3} alkoxy groups or halogen atoms; and

R_4 and R_5, which may be the same or different, each represent hydrogen, C_{1-6} alkyl, C_{1-6} alkyl substituted by hydroxy or C_{1-3} alkoxy, C_{3-6} alkenyl, phenyl C_{1-6} alkyl or pyridyl C_{1-6} alkyl.

21. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as defined in claim **1** to relieve said condition.

4,442,111

ANTITHROMBOTIC SULFIMINO AND SULFOXIMINO INDOLINONES-2

Erich Müller; Josef Nickl; Berthold Narr; Josef Roch; Walter Haarmann, and Johannes M. Weisenberger, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

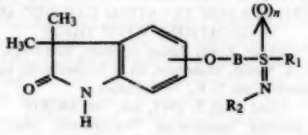
Filed Jul. 6, 1982, Ser. No. 395,631

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 3129444; Oct. 29, 1981, 3142904

Int. Cl.[3] **C07D** *215/22, 209/34;* **A61K** *31/40, 31/47*

U.S. Cl. 424—263 **5 Claims**

1. A compound of the formula



where

n is 1;

B is straight alkylene of 3 to 5 carbon atoms;

R_1 is alkyl of 1 to 6 carbon atoms; benzyl; phenylethyl; cyclohexyl; naphthyl; methoxy-naphthyl; pyridyl-(2), -(3) or -(4); phenyl monosubstituted by alkyl of 1 to 4 carbon atoms, methoxy, cyclohexyl, phenyl, fluorophenyl, fluorine, chlorine or bromine; phenyl disubstituted by alkyls of 1 to 4 carbon atoms, methoxy, chlorine or bromine, where the substituents of the phenyl nucleus may be the same or different; or an aminophenyl, hydroxyphenyl or methoxyphenyl group substituted by two chlorine or bromine atoms, two methoxy groups or two alkyl groups each of 1 to 4 carbon atoms; and

R_2 is hydrogen; alkanoyl of 1 to 8 carbon atoms; methoxy(alkanoyl of 1 to 8 carbon atoms); benzoyl; benzoyl monosubstituted by halogen, cyano or alkyl of 1 to 4 carbon atoms; phenylsulfonyl; phenylsulfonyl monosubstituted by halogen, cyano or alkyl of 1 to 4 carbon atoms; alkoxycarbonyl of 2 to 4 carbon atoms; aminocarbonyl; (chlorophenyl-amino)carbonyl; methylamino-carbonyl; dime-

thylamino-carbonyl; naphthoyl; pinanoyl; camphorsulfonyl; pentamethylphenylsulfonyl or nicotinoyl.

4. An antithrombotic pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antithrombotic amount of a compound of claim 1.

4,442,112

DIHYDROPYRIDINE DERIVATIVES USEFUL IN TREATING VASCULAR HEADACHES

Else Müller-Schweinitzer, Oberdorf, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

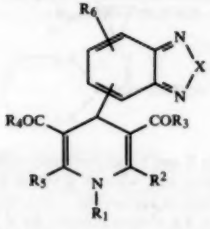
Filed Aug. 24, 1982, Ser. No. 411,101

Claims priority, application United Kingdom, Sep. 2, 1981, 8126574

Int. Cl.³ A61U *31/44, 31/445*

U.S. Cl. 424—263 12 Claims

1. A method for treating or preventing vascular headaches, which comprises administering a therapeutically effective amount of a compound of formula I.



I

wherein

R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl or alkinyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 8 carbon atoms, phenylalkyl of 7 to 9 carbon atoms or phenylalkenyl or 9 to 12 carbon atoms, the phenyl ring being unsubstituted or mono-, di- or trisubstituted independently by halogen, hydroxy or alkyl or alkoxy of 1 to 4 carbon atoms.

R_2 and R_5, independently, are hydrogen or alkyl of 1 to 6 carbon atoms,

R_3 and R_4, independently, are alkyl of 1 to 6 carbon atoms, alkenyl or alkinyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 8 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxyalkoxy of 2 to 6 carbon atoms, alkoxyalkoxy of 3 to 6 carbon atoms, hydroxyalkoxyalkoxy of 4 to 8 carbon atoms, alkenyloxy or alkinyloxy of 3 to 6 carbon atoms, cycloalkyloxy of 3 to 7 carbon atoms or cycloalkylalkoxy of 4 to 8 carbon atoms,

R_6 is hydrogen, halogen, alkyl or alkoxy or alkylthio or alkylsulfonyl, each of 1 to 4 carbon atoms, trifluoromethyl, nitro or hydroxy, and X is oxygen or sulphur,

to a subject in need of such treatment.

4,442,113

LONG-TERM WEIGHT REDUCTION OF OBESE PATIENTS USING FEMOXETINE

Joergen B. Lassen, Glostrup; Birte K. Skrumsager, Broenshoej, and Joergen A. Christensen, Virum, all of Denmark, assignors to A/S Ferrosan, Soborg, Denmark

Filed May 7, 1981, Ser. No. 261,479

Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 16 Claims

1. The method of reducing appetite to obtain weight control and reduction in an obese human patient which comprises the step of orally or rectally administering to the said patient an appetite suppressing amount of a compound selected from the group consisting of femoxetine and a pharmaceutically-acceptable salt thereof over a period of at least eight (8) weeks.

4,442,114

IMIDE DERIVATIVES

John L. Belletire, Madison, Wis., and Reinhard Sarges, Mystic, Conn., assignors to Pfizer Inc., New York, N.Y.

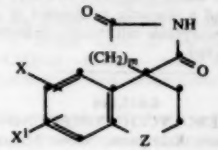
Division of Ser. No. 292,751, Aug. 13, 1981, abandoned, which is a division of Ser. No. 106,577, Dec. 26, 1979, Pat. No. 4,307,108.

This application Jan. 17, 1983, Ser. No. 458,700

Int. Cl.³ C07D *211/88;* A61K *31/445*

U.S. Cl. 424—267 2 Claims

1. A method of treating a diabetic host to prevent or alleviate diabetes-associated chronic complications, which comprises administering to said host an effective amount of a compound selected from the group consisting of spiro-imides of the formula:



I

and the base salts thereof with pharmacologically acceptable cations, wherein

W is $-(CH_2)_n-$;

X is hydrogen, chlorine, lower alkyl or lower alkoxy;

X^1 is hydrogen, fluorine, chlorine, bromine, lower alkyl, lower alkoxy or phenyl, with the proviso that when X^1 is fluorine, bromine or phenyl, X is hydrogen;

Y is oxygen or sulfur;

Z is W, Y or Q wherein Q is oxosulfur or dioxosulfur;

m is two; and

n is zero or one.

4,442,115

2'HYDROXY TETRAZOLE-5-CARBOXANILIDES AND ANTI-ALLERGIC USE THEREOF

Christopher A. Ramsden, Brentwood; Philip Knowles, Rayleigh; Edward J. Lewis, Romford; Edward Lunt, Westcliff-On-Sea, and Derek E. Wright, South Benfleet, all of England, assignors to May & Baker Limited, Essex, England

Continuation of Ser. No. 954,785, Oct. 26, 1978, abandoned.

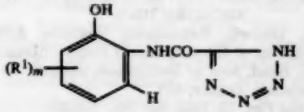
This application Jun. 1, 1979, Ser. No. 44,511

Claims priority, application United Kingdom, Oct. 28, 1977, 45097/77

Int. Cl.³ C07D *257/04;* A61K *31/41*

U.S. Cl. 424—269 43 Claims

1. A tetrazole of the formula:



I

wherein R^1 represents a halogen atom, an alkyl, alkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl or alkylsulphamoyl group, each such group having from 1 to 6 carbon atoms, a dialkylsulphamoyl, dialkylamino, or dialkylcarbamoyl group (wherein each of the two alkyl groups has from 1 to 4 carbon atoms), an alkanoyl, alkoxycarbonyl, alkoxycarbonylamino, alkylcarbamoyl or alkanoylamino group of from 2 to 6 carbon atoms, a cycloalkylcarbonyl group of from 3 to 8 carbon atoms in the cycloalkyl moiety, or a hydroxy, formyl, nitro, trifluoromethyl, trifluoroacetyl, phenyl, benzyloxycarbonylamino, amino, sulphamoyl, cyano, tetrazol-5-yl, carboxy, carbamoyl, benzyloxy, phenylacetyl or benzoyl group, or a group of the formula:

$-CR^2{=}NOR^3$

II

(wherein R^2 represents a hydrogen atom, an alkyl group of from 1 to 5 carbon atoms, a phenyl, phenylalkyl or trifluoromethyl group, or a cycloalkyl group of 3 to 8 carbon atoms, and R^3 represents a hydrogen atom, an alkyl group of from 1 to 6 carbon atoms unsubstituted or substituted by a phenyl group, or represents a phenyl group unsubstituted or substituted by one substituent selected from halogen atoms and alkyl and alkoxy groups of from 1 to 6 carbon atoms and hydroxy, trifluoromethyl and nitro groups), and m represents zero, 1, or 2, the substituent R^1 being in the 3- or 5-position when m is 1 and the substituents R^1 being the same or different and being in the 3- and 5-positions when m is 2 and pharmaceutically acceptable salts thereof.

42. A pharmaceutical composition useful in the treatment of allergic conditions which comprises, as active ingredient, an effective amount of a tetrazole as claimed in claim **1**, or a pharmaceutically acceptable salt thereof, in association with a pharmaceutical carrier.

4,442,116
HETEROCYCLIC COMPOUNDS

Isao Iwataki; Minoru Kaeriyama; Nobuo Matsui, and Tomio Yamada, all of Kanagawa, Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan

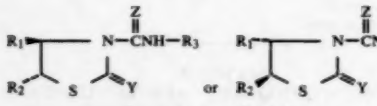
Division of Ser. No. 187,412, Sep. 15, 1980. This application Feb. 19, 1982, Ser. No. 350,368

Claims priority, application Japan, Oct. 3, 1979, 54-127707; Apr. 18, 1980, 55-50363

Int. Cl.[3] **C07D** *277/14, 277/16;* **A01N** *43/78*

U.S. Cl. 424—270 **27 Claims**

1. A compound represented by the formula



or racemate thereof wherein

each of Y and Z is oxygen or sulfur,

R_1 is alkyl of one to four carbon atoms,

R_2 is thienyl, furyl, phenyl, phenyl having one alkoxy, or phenyl having one or two substituents selected from a group consisting of alkyl, halogen, haloalkyl, nitro and methylenedioxy, and

R_3 is a five to seven membered cycloalkyl with or without one or two methyl, cyclohexenyl or tetrahydropyranyl.

4,442,117
HOMOSERINE DERIVATIVES AND THEIR USE AS MICROBICIDES

Walter Kunz, Oberwil, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany; Adolf Hubele, Magden, and Peter Riebli, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

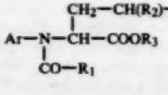
Filed Oct. 23, 1980, Ser. No. 199,903

Claims priority, application Switzerland, Oct. 26, 1979, 9631/79; Sep. 24, 1980, 7150/80

Int. Cl.[3] **A01N** *37/22;* **C07C** *103/66, 103/737*

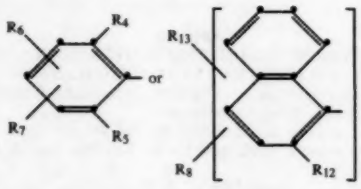
U.S. Cl. 424—273 R **49 Claims**

1. A homoserine derivative of the formula I

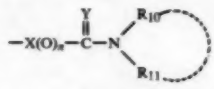


(I)

wherein R_1 is alkyl of 2 to 6 carbon atoms wich is optionally interrupted by an oxygen or a sulfur atom, 2-furyl, 2-tetrahydrofuryl, 1H-1,2,4-triazolylmethyl, 1-imidazolylmethyl, 1-pyrazolylmethyl, C_2–C_4-alkenyl or cyclopropyl, each of which is unsubstituted or is substituted by halogen, or when B is halogen, R_1 may also be halomethyl, R_2 is hydrogen or methyl; R_3 is hydrogen or C_1–C_4-alkyl; Ar is



in which R_4 is C_1–C_3-alkyl, C_1–C_3-alkoxy or halogen, R_5 is C_1–C_3-alkyl, C_1–C_3-alkoxy, NH_2, halogen or NO_2, R_6 is hydrogen, NO_2, NH_2, C_1–C_3-alkyl, C_1–C_3-alkoxy or halogen, R_7 and R_8 are each hydrogen or methyl, R_{12} is methyl, NO_2 or NH_2, R_{13} is hydrogen, methyl, NO_2 or NH_2; and B is one of the following groups $—X(O)_kH$, $—X(O)_mR_9$,



or halogen, wherein X and Y independently of one another are each oxygen or sulfur, and, when X is sulfur, k has the value nought or 3, and n and m are nought, 1 or 2, whilst when X is oxygen k, m and n are always nought, R_9 is a C_1–C_5-alkyl group which is unsubstituted or substituted by halogen, C_1–C_3-alkoxy or C_1–C_3-alkylthio, R_{10} is hydrogen, methyl or ethyl, R_{11} is a C_1–C_5-alkyl group which is unsubstituted or substituted by halogen, or R_{11} is a phenyl group which is unsubstituted or substituted by halogen, methyl, trifluoromethyl or nitro, or R_{10} and R_{11} together with the nitrogen atom to which they are bound form an imidazole or 1,2,4-triazole ring.

25. A composition for combating and/or preventing an infection by pathogenic microorganisms, which comprises as active ingredient an effective amount of a compound according to claim **1**, together with a suitable carrier therefor.

4,442,118
ALDOSE REDUCTASE INHIBITION BY 1-(4-CHLOROBENZOYL)-5-METHOXY-2-METHYL-1H-INDOLE-3-ACETIC ACID

Dushan M. Dvornik, Mount Royal, and Nicole Simard-Duquesne, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison, Inc., Montreal, Canada

Filed Jul. 23, 1981, Ser. No. 286,227

Int. Cl.[3] **A61K** *31/40*

U.S. Cl. 424—274 **5 Claims**

1. A method of treating a diabetic complication, selected from the group consisting of cataracts, neuropathy, nephropathy and retinopathy, in a diabetic mammal which comprises administering to said mammal in need of such treatment an effective lens aldose reductase inhibiting amount of 1-(4-chlorobenzoyl)-5-methoxy-2-methyl-1H-indole-3-acetic acid, or a therapeutically acceptable salt thereof with an organic or inorganic base.

4,442,119

CYCLOPROPYL ANALOGS AND ESTROGENIC AS ANTI-FERTILITY AGENTS

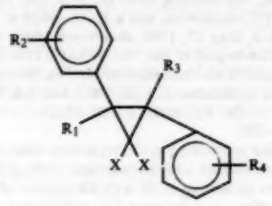
Robert A. Magarian, and Joseph T. Pento, both of Norman, Okla., assignors to The Board of Regents for the University of Oklahoma, Norman, Okla.

Continuation-in-part of Ser. No. 166,081, Jul. 7, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 402,112

Int. Cl.[3] **A01N** *43/36;* **A61K** *31/40;* **A01N** *29/04*

U.S. Cl. 424—274 **19 Claims**

1. A method of treating a normal or pathological condition responsive to estrogenic activity in a female subject in need of such therapy comprising administering to the subject an estrogenically effective, non-toxic dosage of an agent having the generic structure:



wherein:

X is a halogen or hydrogen atom;

R_1 is a hydrogen atom, an alkyl group, containing from 1 to about 3 carbon atoms, a monocyclic group, or an alkoxy substituted monocyclic group in which the alkyl substituent contains from 1 to about 3 carbon atoms;

R_2 is a hydroxyl group;

R_3 is a hydrogen atom or an alkyl group containing from 1 to about 3 carbon atoms; and

R_4 is a hydrogen atom, a hydroxyl group, or an alkoxy group in which the alkyl substituent contains from 1 to about 3 carbon atoms.

4,442,120

1-ARYLOXY-3-ALKYLAMINO-PROPAN-2-OLS

Herbert Köppe; Werner Kummer; Helmut Stähle; Gojko Muacevic, and Werner Traunecker, all of Ingelheim, Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

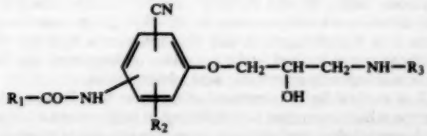
Filed Jul. 15, 1982, Ser. No. 398,577

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133678

Int. Cl.[3] **A61K** *31/36, 31/275;* **C07C** *121/80;* **C07D** *317/60*

U.S. Cl. 424—282 **9 Claims**

1. A compound of the formula



wherein

R_1 is cycloalkyl of 3 to 10 carbon atoms; phenyl; mono- or poly-substituted phenyl, where the substituents are halogen, lower alkyl, lower alkoxy, lower alkenyl, lower alkinyl, lower alkinyloxy, lower cycloalkyl, acyl, acyloxy, lower alkoxycarbonyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl or the ring-forming groups $(-CH=CH-)_2$ or $-O-CH_2-O-$ attached to vicinal carbon atoms of the phenyl ring; aryl-oxy-lower alkyl; (mono- or poly-substituted aryl)-oxy-lower alkyl, where the substituents are halogen, lower alkyl, lower alkoxy, lower alkenyl, lower alkinyl, lower alkinyloxy, lower cycloalkyl, acyl, acyloxy, lower alkoxycarbonyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl or the ring-forming groups $(-CH=CH-)_2$ or $-O-CH_2-O-$ attached to vicinal carbon atoms of the phenyl ring;

R_2 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or the ring-forming group $(-CH=CH)_2$ or $-(CH_2)_n-$, where n is an integer from 3 to 5, attached to vicinal carbon atoms of the phenyl ring; and

R_3 is straight or branched alkyl of 1 to 10 carbon atoms;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

7. The method of treating tachycardia in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective amount of a compound of claim 1.

4,442,121

1-ARYLOXY-3-ALKINYLAMINO-PROPAN-2-OLS

Herbert Köppe; Werner Kummer; Helmut Stähle; Gojko Muacevic, all of Ingelheim, and Werner Traunecker, Münster-Sarmsheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim K.G., Ingelheim am Rhein, Fed. Rep. of Germany

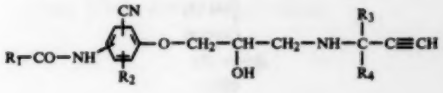
Filed Jul. 15, 1982, Ser. No. 398,578

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133719

Int. Cl.[3] **A61K** *31/36, 31/275;* **C07C** *121/80;* **C07D** *317/60*

U.S. Cl. 424—282 **8 Claims**

1. A compound of the formula



wherein

R_1 is cycloalkyl of 3 to 10 carbon atoms; phenyl; mono- or poly-substituted phenyl, where the substituents are halogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkinyl, nitro, trifluoromethyl, hydroxyl, acyl, acyloxy, lower alkoxycarbonyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl or the ring-forming groups $(-CH=CH-)_2$ or $-O-CH_2-O-$ attached to vicinal carbon atoms of the phenyl ring; aryloxy-lower alkyl; (mono- or poly-substituted aryl)-oxy-lower alkyl, where the substituents are halogen, lower alkyl, lower alkoxy, lower alkenyl, lower alkinyl, acyl, acyloxy, nitro, trifluoromethyl or the ring-forming groups $(-CH=CH-)_2$ or $-O-CH_2-O-$ attached to vicinal carbon atoms of the aryl ring;

R_2 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or the ring-forming group $(-CH=CH)_2$ or $-(CH_2)_n-$, where n is an integer from 3 to 5, attached to vicinal carbon atoms of the phenyl ring;

R_3 is hydrogen or alkyl of 1 to 3 carbon atoms; and

R_4 is alkyl of 1 to 3 carbon atoms or, together with R_3, a ring-forming group $-(CH_2)_p-$, where p is an integer from 4 to 6;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

6. The method of treating tachycardia in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective amount of a compound of claim 1.

4,442,122

1,2-DIBROMO-2-CYANOALKANE ANTIMICROBIAL COMPOUNDS

John E. Engelhart, Westfield; Marshall R. Angeles, Scotchplains, both of N.J., and Michael J. D'Errico, Flossmoor, Ill., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 22, 1981, Ser. No. 333,276
Int. Cl.³ C07C *121/16, 121/46;* A01N *37/34*
U.S. Cl. 424—304 10 Claims

1. 1,2-dibromo-2-cyanononane.

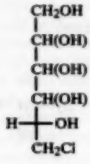
4,442,123

6-CHLORO-6-DEOXY-D-HEXITOLS, COMPOSITIONS CONTAINING THEM AND THEIR USE IN FERTILITY CONTROL

Elner B. Rathbone, Wokingham; Geoffrey M. H. Waites, Reading, and William C. L. Ford, Newbury, all of England, assignors to Tate & Lyle Public Limited Company, England

Continuation of Ser. No. 124,461, Feb. 25, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 334,550
Claims priority, application United Kingdom, Feb. 28, 1979, 7907089; Mar. 12, 1979, 7908627
Int. Cl.³ A01N *37/10, 31/00;* A61K *31/235, 31/045*
U.S. Cl. 424—308 6 Claims

1. A male fertility-inhibiting composition containing an effective fertility-inhibiting amount of 6-chloro-6-deoxy-D-hexitol of the general formula:



or a physiologically acceptable esterified form thereof together with a pmaceutically acceptable carrier or excipient.

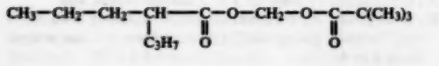
4,442,124

VALPROIC ACID ESTER WITH ANTIEPILEPTIC AND ANTICONVULSANT ACTIVITY AND PHARMACEUTICAL COMPOSITIONS THEREFROM

Zemp J. Niklaus, Vaduz, Liechtenstein, assignor to Texcontor-Anstalt, Vaduz, Liechtenstein

Filed Jun. 2, 1980, Ser. No. 155,588
Claims priority, application Italy, Jun. 8, 1979, 23392 A/79
Int. Cl.³ C07C *69/28;* A61K *31/22*
U.S. Cl. 424—311 2 Claims

1. The compound pivaloyloxymethyl 2-propyl-pentanoate of formula I:



4,442,125

PROCESS FOR DETACHING OR PREVENTING ATTACHMENT OF MICROORGANISMS TO A SURFACE

Geraldine H. Thiele, New Oxford, Pa., assignor to Oxford Hill, Ltd., New Oxford, Pa.

Continuation-in-part of Ser. No. 918,792, Jun. 26, 1978, Ser. No. 918,795, Jun. 26, 1978, Ser. No. 918,817, Jun. 26, 1978, Ser. No. 927,614, Jul. 24, 1978, Ser. No. 929,119, Jul. 27, 1978, Ser. No. 961,932, Nov. 30, 1978, Ser. No. 724,942, Sep. 20, 1976, abandoned, Ser. No. 724,943, Sep. 20, 1976, abandoned, Ser. No. 113,362, Feb. 8, 1971, Pat. No. 3,741,204, Ser. No. 123,830, Mar. 12, 1971, Pat. No. 3,767,812, Ser. No. 283,662, Aug. 25, 1972, Pat. No. 3,805,776, Ser. No. 369,236, Jun. 12, 1973, Pat. No. 3,924,000, Ser. No. 483,010, Jun. 25, 1974, Pat. No. 3,982,017, Ser. No. 283,663, Aug. 25, 1972, Pat. No. 3,828,772, and a continuation of Ser. No. 755,400, Dec. 29, 1976, Pat. No. 4,097,064, Ser. No. 890,239, Mar. 27, 1978, Ser. No. 642,114, Dec. 18, 1975, abandoned, and a continuation of Ser. No. 153,573, May 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 965,319, Dec. 1, 1978, abandoned, which is a continuation of Ser. No. 890,239, Mar. 27, 1978. This application Jun. 21, 1982, Ser. No. 390,706
Int. Cl.³ A01N *37/00, 35/02*
U.S. Cl. 424—318 18 Claims

1. Process for preventing microorganisms from attaching or reattaching to a surface which comprises treating the microorganisms or the surface or both with an amount of a liquefied composition effective to prevent said attachment or reattachment of said microorganisms, said liquefied composition consisting essentially of an effective amount of a non-necrotic sclerosing fatt6y acid salt which prevents said attachment or reattachment of said microorganisms, ethyl alcohol in an amount of about 0.5 to about 10 percent, a buffering agent and a water carrier, said salt containing an unsaturated fatty acid having one double bond moiety and containing an alkali metal or an alkaline earth metal, said fatty acid salt having 14 to 22 carbon atoms, and said liquefied composition having a pH between 9 and 11, said buffer being used in an amount sufficient to maintain said pH range, whereby the microorganism is prevented or retarded from attaching or reattaching to the surface.

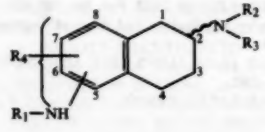
4,442,126

1,2,3,4-TETRAHYDRONAPHTHALENE DERIVATIVES

Nigel R. A. Beeley, Villebon sur Yvette; Gerard Cremer, Chilly Mazarin; Michael J. Dimsdale, Villebon sur Yvette, and Philippe Manoury, Le Plessis Robinson, all of France, assignors to Synthelabo, Paris, France

Filed Sep. 15, 1982, Ser. No. 418,265
Claims priority, application France, Sep. 16, 1981, 81 17454
Int. Cl.³ A61K *31/165;* C07C *103/365*
U.S. Cl. 424—324 8 Claims

1. A 1,2,3,4-tetrahydronaphthalene derivative of the formula:



wherein R_1 represents an alkanoyl group containing from 1 to 4 carbon atoms, R_2 and R_3 each represent, independently of one another, a hydrogen atom or an alkyl group containing from 1 to 4 carbon atoms, and R_4 represents a hydroxy or methoxy group located in the 6-position or 7-position, and its pharmacologically-acceptable acid addition salts.

7. A method for the treatment of a patient with Parkinson's disease which comprises administering to such patient a tetrahydronaphthalene derivative as claimed in any one of claims 1, 2, 3, 4 or 5, or a pharmacologically-acceptable acid addition

salt thereof, in an amount effective to ameliorate the condition of the patient.

4,442,127

NAPHTHOQUINONE ANTI-PSORIATIC AGENTS

Gordon H. Jones, Cupertino, and John M. Young, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

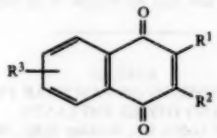
Continuation-in-part of Ser. No. 255,624, Apr. 20, 1981, abandoned, which is a continuation of Ser. No. 144,479, Apr. 28, 1980, abandoned, which is a division of Ser. No. 912,697, Jun. 5, 1978, Pat. No. 4,229,478. This application Jan. 19, 1983, Ser. No. 459,165

The portion of the term of this patent subsequent to Oct. 21, 1997, has been disclaimed.

Int. Cl.³ A61K *31/12, 31/275;* **C07C** *50/00, 97/18*

U.S. Cl. 424—331 **14 Claims**

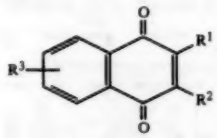
1. A composition in a form for topical administration to mammals for relieving the condition of psoriasis which comprises a pharmaceutically acceptable, non-toxic carrier and a psoriasis-relieving amount of a compound of the formula



(I)

where R^1 and R^2 are lower alkoxy of one to six carbon atoms and R^3 is halo or cyano.

11. A method for relieving the condition of psoriasis which comprises topically administering to mammals in need thereof an effective amount of a compound of the formula



(I)

wherein R^1 and R^2 are lower alkoxy of one to six carbon atoms and R^3 is halo or cyano.

4,442,128

PRODUCTION OF FERMENTED WHEY PRODUCTS CONTAINING A THICKENING POLYMER

Robert D. Schwartz, Concord, and Elizabeth A. Bodie, El Cerrito, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 20, 1981, Ser. No. 284,421

Int. Cl.³ A23C *21/02;* **C12P** *19/06;* **C12N** *1/14;* **C12R** *1/64*

U.S. Cl. 426—41 **10 Claims**

1. A process for producing a functionalized dairy whey product comprising the steps of:

(a) forming a fermentation broth of unhydrolyzed whey containing unhydrolyzed lactose, and glucose; and

(b) fermenting the broth with the organism *Xanthomonas campestris* ATCC 31922 to produce a functionalized dairy whey product containing a thickening polymer produced by the organism.

10. A biologically pure culture of the organism *Xanthomonas compestris* ATCC 31922 having the ability to grow in a fermentation broth of unhydrolyzed whey containing unhydrolyzed lactose and glucose to produce a functionalized whey product containing a thickening polymer produced by the organism.

4,442,129

PROCESS FOR SEALING GLASS CONTAINER OPENINGS

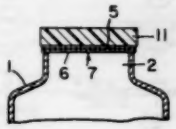
Susumu Niwa, Wako, and Masao Koike, Sakura, both of Japan, assignors to Kabushiki Kaisha Hosokawa Yoko, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,705

Claims priority, application Japan, Jul. 20, 1981, 56-112119

Int. Cl.³ B65B *7/28*

U.S. Cl. 426—399 **10 Claims**



1. Process for affixing covers onto glass containers which comprises the steps of:

(a) providing a glass container having an opening end;

(b) providing a cover comprising a piece of metal foil having a shape suitable for covering said opening end and a sealant layer of a thermoplastic resin laminately secured to one surface of the metal foil;

(c) preheating the opening end of said glass container;

(d) placing the cover on the opening end so that the sealant layer contacts the opening end;

(e) pressing the cover, as it is heated, against the opening end by means of a heating plate having a cushioning layer provided on the part of the heating plate which contacts the cover thereby to cause the cover to adhere to the opening end of the glass container through the heating of the sealing thermoplastic resin so that said sealant is in an adhesive state; and

(f) pressing the cover against the opening end of the glass while said sealant is in an adhesive state by means of a pressing plate at a temperature lower than that of the heating plate in step (e) so as to cool said sealant thereby assuring positive sealing of the opening end by the cover;

said heating plate means of step (e) and pressing plate means of step (f) being entirely separate means.

4,442,130

CONTINUOUS PROCESSING OF RICE

Harry S. Autrey, and John W. Hunnell, both of Houston, Tex., assignors to Riviana Foods, Inc., Houston, Tex.

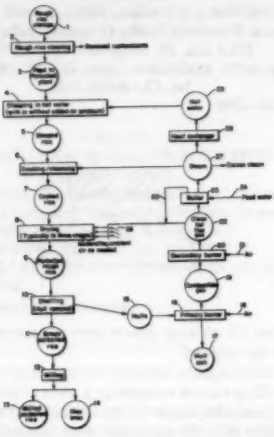
Filed Jan. 13, 1982, Ser. No. 339,076

Int. Cl.³ A23L *1/10;* **A23B** *9/00*

U.S. Cl. 426—462 **4 Claims**

1. In a method for producing parboiled rice which comprises the steps of heat treating paddy rice to produce cooked rice, shelling the cooked rice to produce hulls and brown rice, feeding said hulls to a burner wherein the hulls are burned in a first stage under controlled temperature conditions below the fusion point of silica to produce ash and volatile components and whereby said volatile components are delivered to a second stage where complete combustion of said volatile compo-

nents takes place in a higher temperature range, and feeding at least a portion of the products of combustion resulting from



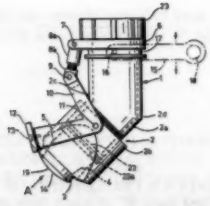
said second stage combustion into direct contact with said cooked rice to effect predetermined drying of said cooked rice.

4,442,131

ANGLED DOUGH CUTTER

Alex J. Nagy, Mississauga, and William G. Reed, Toronto, both of Canada, assignors to Margaret's Fine Food Ltd., Toronto, Canada

Filed Jan. 8, 1981, Ser. No. 223,322
Claims priority, application Canada, Jan. 8, 1980, 343223
Int. Cl.³ B29F *3/08*; A21C *3/04, 11/10, 11/16*
U.S. Cl. 426—518 **8 Claims**



1. A method of cutting donuts of a desired shape which comprises the steps of

(a) forcing dough under pressure into a discharge tube having a lower end face inclined at an angle from the horizontal and defining but a single through outlet opening;

(b) extruding the dough under pressure through the outlet opening which is longer vertically than horizontally and larger on the top than on the bottom;

(c) cutting the dough with a knife mounted for cutting movement across the outlet opening from top to bottom while said dough is extruding.

4,442,132

LIGHT BAKERY PRODUCTS FOR DIABETICS AND METHOD FOR THE PREPARATION OF THESE PRODUCTS

Jong C. Kim, Bennekom, Netherlands, assignor to C.V. Chemie Combinatie Amsterdam C.C.A., Gorinchem, Netherlands

Continuation of Ser. No. 260,997, May 6, 1981, abandoned, which is a continuation of Ser. No. 92,497, Nov. 8, 1979, abandoned. This application Jul. 30, 1982, Ser. No. 403,718
Claims priority, application Netherlands, Nov. 13, 1978, 7811204
Int. Cl.³ A21D *13/00*; A23L *1/32*
U.S. Cl. 426—549 **5 Claims**

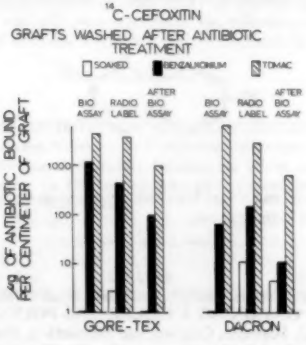
1. Light bakery products for diabetics, having a digestible carbohydrate content of less than 10% by weight and prepared from a dough consisting essentially of a major amount of egg in the form of whole egg or egg albumin, 2–30% by weight of a protein-containing flour substitute of which at least 50% by weight is supplied by calcium caseinate, wheat flour in an amount up to 15% by weight of the total mixture, 3–40% by weight of minced nuts, 5–50% by weight of a sugar alcohol selected from the group consisting of lactitol, sorbitol and xylitol, and 0% by weight of sugar, and wherein the weight % of weight flour is less than the weight % of flour substitute.

4,442,133

ANTIBIOTIC BONDING OF VASCULAR PROSTHESES AND OTHER IMPLANTS

Ralph S. Greco, 29 Goltra Dr., Basking Ridge, N.J. 07920, and Richard A. Harvey, 1 Overland Rd., East Brunswick, N.J. 08816

Filed Feb. 22, 1982, Ser. No. 351,324
Int. Cl.³ A61F *1/00, 1/24*
U.S. Cl. 427—2 **3 Claims**



1. The method of preparing a vascular graft comprising the steps of

preparing a length of a graft material,

soaking said length of graft material in a solution of about 5% by weight of tridodecyl methyl ammonium chloride in ethanol for about 30 minutes at room temperature,

washing said graft in distilled water to remove excess tridodecyl methyl ammonium chloride but leaving an adsorbed coating thereon,

incubating, for about one hour, the graft carrying the adsorbed coating of tridodecyl methyl ammonium chloride in a solution of antibiotic selected from the group consisting of penicillin, oxacillin, ticarcillin, carbenicillin, the cephalosporins, and cefoxitin,

washing the graft in sterile water to remove unbound antibiotic, and

storing the graft for use in the operating room.

4,442,134

CHEMICAL DEPOSITION TERMINATION

Werner Kern, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1983, Ser. No. 476,781
Int. Cl.³ B05D 1/06, 5/12
U.S. Cl. 427—9 19 Claims

9. A method of forming a coating of a material on a substrate comprising:

(a) providing an aqueous solution of said material in a suitable vessel;

(b) immersing the substrate in said solution;

(c) introducing into the vessel an organic displacement liquid so that it forms a layer overlying the aqueous coating solution, said liquid and water each having a solubility in the other of at least about 0.5 percent by volume; and

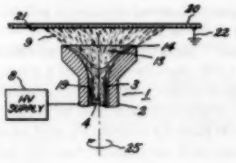
(d) when a predetermined amount of material has been deposited on the substrate, rapidly raising the substrate into the displacement liquid thereby terminating the coating of the substrate.

4,442,135

METHOD FOR COATING WITH AN ATOMIZABLE MATERIAL

Robert W. L. Snaddon, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,510
Int. Cl.³ B05D 4/02, 4/06; B05B 3/10, 5/04
U.S. Cl. 427—31 13 Claims



1. A method for atomizing an atomizable material including particulate matter, comprising:

a) delivering said material from a source thereof to a surface of a rotatable atomizer adapted to receive said material substantially uniformly around the axis of rotation of said surface, said surface of said atomizer rotating with said atomizer;

b) positioning material delivery means spaced from said atomizer and within the interior volume defined by said atomizer and further establishing no seal between said material delivery means and said atomizer;

c) positioning the material delivery means in relation to said source such that neither said delivery means nor said source is impacted by material moving axially away from said surface of said atomizer;

d) shaping said surface of said atomizer such that said material is directed away from the space between said atomizer and said material delivery means; and

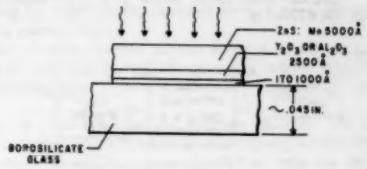
e) rotating said atomizer at a predetermined angular velocity in order to force said material from said surface of said atomizer.

4,442,136

ELECTROLUMINESCENT DISPLAY WITH LASER ANNEALED PHOSPHOR

Milo R. Johnson, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 2, 1982, Ser. No. 354,113
Int. Cl.³ B05D 3/06, 5/12
U.S. Cl. 427—53.1 14 Claims



1. A process for fabricating thin film electroluminescent displays, comprising the steps of:

providing a transparent substrate;

providing a patterned transparent conductor on said substrate;

providing a first continuous dielectric layer on said pattern conductor;

providing a phosphor layer on said first dielectric layer; and

transiently annealing said phosphor to induce recrystallization therein.

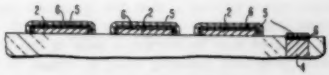
4. The process of claim 1, 2, or 3, wherein said annealing step comprises laser annealing.

4,442,137

MASKLESS COATING OF METALLURGICAL FEATURES OF A DIELECTRIC SUBSTRATE

Ananda H. Kumar, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,444
Int. Cl.³ B05D 3/12, 5/12
U.S. Cl. 427—57 21 Claims



1. A method for selectively depositing a conductive solderable or brazeable metal layer over an existing diverse metallurgical pattern supported on a dielectric substrate comprising:

blanket coating said metal over said substrate, said metal having a different thermal coefficient of contraction relative to said substrate;

heating said substrate to diffusion bond said metal to said metallurgical pattern;

cooling said substrate to spall said metal on the remaining metallurgically unpatterned portions of said substrate by the stresses induced from the differences in the thermal contraction differentials therebetween, and

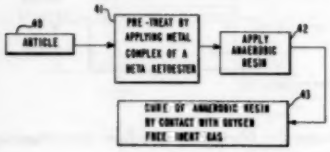
mechanically removing said spalled metal from said remaining unpatterned portions of said substrate.

4,442,138

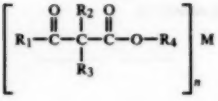
SUBSTRATE PRETREATMENT WITH A METAL-BETA KETO ESTER COMPLEX IN THE METHOD OF CURING AN ANAEROBIC RESIN

George J. Bich, Pittsburgh; Thomas M. Burke, Whitehall, and James D. B. Smith, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 22, 1982, Ser. No. 350,907
Int. Cl.³ B01J 31/12; B05D 3/12, 5/12; D02G 3/00
U.S. Cl. 427—116 24 Claims


ARTICLE
PRE-TREAT BY APPLYING METAL COMPLEX OF A BETA KETOESTER
APPLY ANAEROBIC RESIN
CURE OF ANAEROBIC RESIN BY CONTACT WITH OXYGEN FREE INERT GAS

3. A method of curing an anaerobic resin, comprising the steps of: (1) applying a composition consisting essentially of a metal-beta keto ester complex to a surface of an article, and (2) applying an anaerobic resin comprising acrylic resin to said surface to contact said metal-beta keto ester complex, where the metal-beta keto ester complex has the structural formula:



where M is a transition metal; R_1 is selected from the group consisting of alkyl groups having from 1 to 20 carbon atoms, benzene, naphthalene, anthracene, and hydrocarbon substituted aromatic; R_2 and R_3 are selected from hydrogen, alkyl groups having from 1 to 20 carbon atoms, benzene, naphthalene, anthracene and hydrocarbon substituted aromatic; R_4 is selected from alkyl groups having from 1 to 20 carbon atoms; and n is equal to the valence of the metal M.

9. The method of claim 3, where the composition containing the metal-beta keto ester complex is a solvent solution of a transition metal alkylacetoacetate, and the article is a resin impregnated tape.

15. The method of claim 9, where the resin impregnated tape is wrapped around an electrical coil.

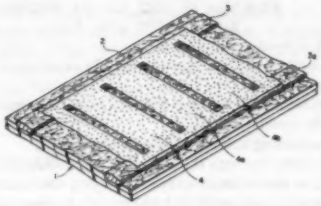
4,442,139

ELEMENTS COMPRISING FIBROUS MATERIALS

Alan Brigham, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 11, 1979, Ser. No. 102,576
The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.
Int. Cl.³ B05D 5/12
U.S. Cl. 427—122 13 Claims

1. A process for modifying an element comprising a support which comprises a continuous film of a polymeric composition and fibrous material which is secured to the support and which protrudes therefrom, at least a portion of the fibrous material which protrudes from the support providing an outer surface of the element and comprising randomly distributed fibers, which process comprises (a) applying to said surface a liquid coating composition comprising a dispersion of solid particles



in a liquid carrier and (b) removing the liquid carrier from the applied coating composition.

4,442,140

AQUEOUS COMPOSITION FOR THE PROTECTION OF PAINT SURFACES

Nobuaki Kawabata; Nobuo Yokoyama, both of Yokohama, and Yoshihiko Araki, Tokyo, all of Japan, assignors to Nippon Oil Co. Ltd., Japan

Filed Apr. 26, 1982, Ser. No. 371,829
Claims priority, application Japan, May 6, 1981, 56-66840
Int. Cl.³ B65B 33/00; C08L 91/06
U.S. Cl. 427—154 23 Claims

1. An aqueous composition for the protection of paint surfaces which comprises an aqueous emulsion containing as essential components

(a) 100 parts by weight of an oxygen-containing wax having an oxygen content of not less than 3.0% by weight and a melting point of 50° to 85° C.,

(b) less than 7 parts by weight of an emulsifying agent,

(c) 10 to 1,000 parts by weight of a substantially white-colored fine powder of an inorganic material having a silicon content of not less than 23% by weight, and

(d) 10 to 200 parts by weight of a white-colored fine powder of an inorganic or organic material substantially free of silicon.

4,442,141

TREATMENT OF CELLULOSE ACETATE BUTYRATE CONTACT LENSES

Drahoslav Lim, San Diego, Calif., assignor to Barnes-Hind/Hydrocurve, Inc., Sunnyvale, Calif.

Filed Nov. 1, 1982, Ser. No. 437,976
Int. Cl.³ B05D 1/18; G02B 1/04, 1/10, 3/00
U.S. Cl. 427—164 12 Claims

1. A process for rendering cellulose acetate butyrate contact lenses hydrophilic which comprises contacting said lenses with a treating agent for a period of time sufficient to increase the hydrophilicity of said lenses; wherein the treating agent is ammoniacal salt, alkali metal hydroxide, a strong mineral acid, benzene sulfonic acid, alkali metal borohydride, or organometallic compound.

4,442,142

NITRILE ELASTOMER TREATING SOLUTION AND METHOD OF TREATING NITRILE ELASTOMER THEREWITH

Martin H. Kaufman, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 147,815, May 8, 1980, Pat. No. 4,355,078. This application Jul. 19, 1982, Ser. No. 399,410

Int. Cl.³ B05D 3/02

U.S. Cl. 427—316 2 Claims

2. A method for bonding a nitrile elastomer surface to an external surface with an epoxy adhesive comprising:

providing a treating solution comprising a concentration of less than 1.0 N of a mineral acid in a carrier comprising water and one of alcohol and ketones,

treating the elastomer surface with the treating solution,

drying the treated surface, and

applying an epoxy adhesive to the surface.

4,442,143

CATALYTIC CURING OF COATINGS

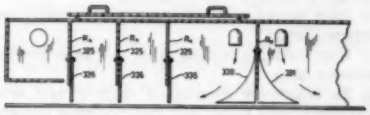
Gordon A. D. Reed, Mount Royal, Canada, assignor to Liquid Carbonic Inc., Canada

Filed Apr. 26, 1982, Ser. No. 372,019

Claims priority, application Canada, Mar. 3, 1982, 397511

Int. Cl.³ C23C 13/04, 13/10

U.S. Cl. 427—340 14 Claims



1. An apparatus for curing a wet catalyst-curable resin on a substrate with a vapor containing a catalyst, comprising,

a treating zone provided by a sealed vapor-curing chamber connected to a sealed entrance chamber at one end and a sealed exit chamber at the other end, the entrance and exit chambers each being separated from the vapor-curing chamber by a wall, each wall being provided with a passage,

each passage being provided with height adjustable means to limit the escape of vapor from the curing chamber,

conveying means running through the treating zone,

a curing vapor generator,

a source of inert gas,

a connection from the inert gas source to the generator,

an impinger near the entrance of the vapor-curing chamber for projecting catalyst vapor against the substrate, and a connection from the vapor generator to the impinger,

connections from the inert gas source to the vapor-curing chamber and to the entrance and exit chambers,

exhaust and scrubber means,

connections from the vapor-curing chamber and entrance and exit chamber to the exhaust and scrubber means,

means for flushing inert gas, from the gas source, through the vapor-curing chamber to the exhaust and scrubber means, for purging the vapor curing chamber,

a connection from the inert gas source to the entrance chamber to provide it with an atmosphere of inert gas to replace the boundary layer of air on the substrate passing through it with a boundary layer of inert gas,

a connection from the inert gas source to the exit chamber to provide it with an atmosphere of inert gas to replace the boundary layer of curing vapor with inert gas,

and control means for controlling the respective gas and vapor connections to balance scour flow and catalyst to achieve minimum dilution of the catalyst vapor and to maintain minimum catalyst concentrations in the chamber.

5. A method for curing a wet catalyst-curable resin on a substrate in which the substrate is passed through a treating zone provided by a sealed vapor-curing chamber connected to a sealed entrance chamber at one end and a sealed exit chamber at the other, the entrance and exit chambers being separated from the vapor-curing chamber by a wall provided with a passage having height adjustable means to limit the escape of vapor from the vapor sealing chamber, comprising,

providing the entrance chamber with an atmosphere of inert gas,

providing the vapor-curing chamber with an atmosphere of curing catalyst vapor,

providing the exit chamber with an atmosphere of inert gas,

passing the substrate through the entrance chamber whereby a boundary layer of air is substantially replaced by inert gas,

passing the substrate from the entrance chamber into the vapor-curing chamber whereby it is exposed to the catalyst vapor in sufficient concentration to cure the resin,

passing the substrate from the vapor-curing chamber into the exit chamber whereby the curing vapor is removed,

providing flow controlling means to balance the flow of inert gas in the entrance/exit chamber with catalyst vapor flow to minimize escape/dilution of the latter.

4,442,144

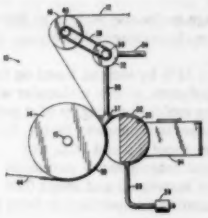
METHOD FOR FORMING A COATING ON A SUBSTRATE

David J. Pipkin, Boulder County, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 207,571, Nov. 17, 1980, Pat. No. 4,345,543, which is a continuation-in-part of Ser. No. 53,143, Jun. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 882,281, Feb. 23, 1978, abandoned. This application Mar. 11, 1982, Ser. No. 356,993

Int. Cl.³ B05C 11/04; B05D 1/40

U.S. Cl. 427—355 6 Claims



1. A method for coating a moving web with a coating liquid comprising:

conducting a moving web over a backing support means;

urging a first portion of at least one stationary smoothing film toward at least a portion of said backing support means by means of pliant pressure generating means, to thereby form a high-hydrodynamic-pressure and a static force coating zone of a length which is coincident with said first portion;

metering a coating liquid onto the web adjacent the confluence of the smoothing film and the web;

providing a second portion of said stationary film which trails said first portion in the direction in which said web is moving, which second portion of said smoothing film is not urged against said web and the coating liquid carried thereby;

adjusting the position of said pliant pressure generating means, relative said backing support means, to thereby control the length of said coating zone; and

adjusting said static force which exists within said controlled-length coating zone in a manner which does not affect the length of said coating zone;

thereby providing a coating nip having a length which is a

function of said position adjustment, and having a static force which is a function of said force adjustment, such that the coating liquid is subjected to said static force, in the environment of the moving web and the first portion of the stationary film, for at least a critical time duration which insures uniform coating to the length of the web.

4,442,145

PROCESS FOR COATING SUBSTRATES WITH POLYISOCYANATES AND POLYHYDROXY POLYACRYLATES

Joachim Probst; Bernd Riberi, both of Cologne, Fed. Rep. of Germany; Günter Kolb, deceased, late of Leverkusen, Fed. Rep. of Germany (by Ingeborg Kolb, heiress), and Peter Höhlein, Kempen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 393,224

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125569

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—385.5 **10 Claims**

1. A process for the production of a coated substrate which comprises

(A) coating said substrate with a coating composition which contains as binder a mixture comprising

(a) a lacquer-grade polyisocyanate-containing biuret, urethane or isocyanurate groups and

(b) a polyhydroxy polyacrylate resin based on a copolymer comprising

(i) about 10 to 20 parts by weight of 2-hydroxyethyl(-meth)-acrylate, 2- or 3-hydroxypropyl(meth)acrylate and/or hydroxybutyl(meth)acrylate,

(ii) about 55 to 80 parts by weight of methyl methacrylate,

(iii) about 8 to 30 parts by weight of 2-ethylhexyl acrylate and

(iv) up to about 2 parts by weight of (meth)acrylic acid,

wherein the polyhydroxy acrylate resin is further characterized by

(1) an average molecular weight as determined by gel permeation chromatography, M_{GPC}, of about 30,000 to 80,000,

(2) about 3 to 15% by weight, based on the total weight of the copolymer, of low molecular weight constituents having molecular weights of at most about 3,000,

(3) a molecular heterogeneity factor, $U = Mw/Mn - 1$, of between about 1.0 and 10.0, and

(4) a chemical heterogeneity parameter δ; for the copolymer of between 0 and about 0.06, and

(B) hardening the coating composition to form a polyurethane coated substrate.

4,442,146

DIBLOCKED DIISOCYANATE DIUREA OLIGOMERS AND COATING COMPOSITIONS COMPRISING SAME

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 334,842, Dec. 28, 1981, Pat. No. 4,396,753. This application Apr. 11, 1983, Ser. No. 472,802

Int. Cl.³ C08G *18/32, 18/58, 18/80;* **C08L** *63/00*

U.S. Cl. 427—386 **24 Claims**

1. A solvent based resin composition comprising:

A. a chain-extendable crosslinkable diblocked diisocyanate diurea oligomer of number average molecular weight about 300 to about 5000 comprising the reaction product of diamine of molecular weight about 50 to about 700, with half-blocked organic diisocyanate of molecular weight about 120 to about 2000 in molar ratio of about 1:2, respectively, said half-blocked organic diisocyanate comprising the reaction product of a monofunctional blocking agent with organic diisocyanate in molar ratio of about 1:1, said oligomer having de-blocking temperature of about 120° C. to about 250° C.

B. polyepoxide bearing about 2 to about 10 epoxide groups and having molecular weight of about 100 to about 1000, in a weight ratio to said oligomer of about 1:1 to about 1:10; and

C. organic solvent.

4,442,147

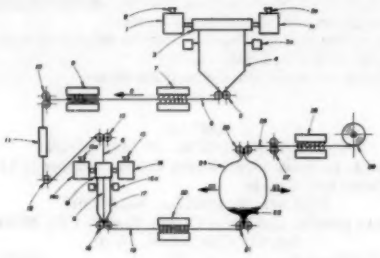
ORIENTED MULTI-LAYER FILMS HAVING A DIFFERENT ORIENTATION DISTRIBUTION BETWEEN LAYERS

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Cryovac Division, Duncan, S.C.

Filed Aug. 9, 1982, Ser. No. 406,590

Int. Cl.³ B32B *27/32*

U.S. Cl. 428—35 **15 Claims**



1. A seamless multi-layer film comprising:

an outer layer having a melting point and an orientation temperature range;

an inner layer having a melting point and an orientation temperature range;

wherein the orientation temperature range of said inner layer is substantially higher than the orientation temperature range of said outer layer and the melting point of said inner layer is substantially higher than both the melting point and the orientation temperature range of said outer layer; and with

said inner and outer layers having a different orientation distribution.

4,442,148

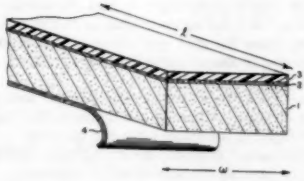
WATERPROOFING LAMINATE

Robert F. Stierli, Lexington, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Oct. 2, 1981, Ser. No. 307,702

Int. Cl.³ B32B *3/00, 11/00, 5/14*

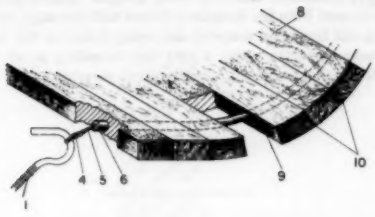
U.S. Cl. 428—40 **8 Claims**



1. An improved pre-formed, sheet-like flexible laminate for waterproofing structural surfaces, said laminate being comprised of (a) a flexible waterproof and waterproofing bituminous membrane having oil therein; (b) a flexible non oil-resistant polymeric support sheet for said membrane non-removably adhered thereto and covering at least one major surface of said membrane; and (c) intermediate said bituminous membrane and said support sheet, an oil resistant and oil-impermeable barrier formed by depositing a coating of an oil-resistant polymer to said sheet and/or said membrane, whereby oil present

in said bituminous membrane is prevented from substantially contacting said polymeric sheet.

4,442,149
CABLE TENSION GLUING PROCESS
Garry K. Bennett, 1011 Grand St., Alameda, Calif. 94501
Filed Apr. 27, 1981, Ser. No. 257,940
Int. Cl.[3] B32B *3/00, 7/08*
U.S. Cl. 428—53 8 Claims

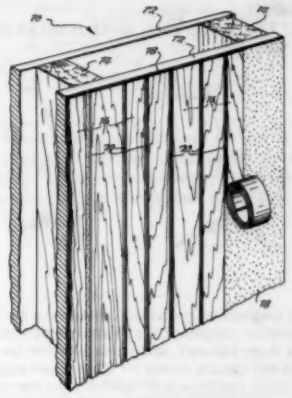


1. In a method for forming a predetermined curved shape from multiple pieces without the use of a jig, form or press, the steps comprising:
(a) forming the multiple pieces with opposite glue surfaces,
(b) selecting an angular relationship for the glue surfaces of each piece to mate with glue surfaces of adjacent pieces and form the predetermined curved shape,
(c) aligning internal passages extending between the glue surfaces of the respective pieces,
(d) applying glue means to the glue surfaces,
(e) routing a tensioning cable means through the aligned passages,
(f) connecting tensioning devices at each end of the cable means for bearing against end pieces of the curved shape, and
(g) applying tension to the cable means by the tensioning devices whereby the multiple pieces are drawn into the predetermined curved shape with pressure applied between adjacent glue surfaces.

4,442,150
FLEXIBLE TWO-DIMENSIONAL MATERIAL
Wolfgang H. A. Greiner, Wolfstr. 34, and Magnus Mauch, J.Kerner-Str. 2, both of D-7320 Gppingen, Fed. Rep. of Germany
Filed Dec. 1, 1981, Ser. No. 326,334
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1980, 3039520
Int. Cl.[3] B32B *3/00*
U.S. Cl. 428—53 6 Claims

1. A flexible two-dimensional material composed solely of a plurality of identical link members which are articulatedly connected directly to each other only by each other in a pattern of rows, wherein each of said links includes
(1) two integrally formed connecting sections located in a first portion of each link, and
(2) aperture means in another portion of each link located at a spaced distance away from the two connecting sections in that said link, said aperture means engaging with one connecting section from each of two adjacent links, each of the two connecting sections being in the form of a strap, the two straps of the two connecting sections being parallel to each other and the inner edge of each strap being aligned with the outer edge of the link of which it forms a part and the external edges of said straps being offset outwardly from the outer edges of the link of which it forms a part.

4,442,151
WOOD PLANK WALLCOVERING SYSTEM USING WIDTHS OF 3 TO 8 INCHES
Daniel A. Winkowski, Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.
Filed Dec. 3, 1981, Ser. No. 327,242
Int. Cl.[3] B32B *3/10*
U.S. Cl. 428—54 10 Claims



1. A wallcovering combination for covering a single wall comprising a plurality of strips of wallcovering in a form which prior to being adhered to a wall is suitable for being adhered to a wall, of sufficient flexibility prior to being adhered to a wall to be rolled up and unrolled, all having a generally similar design, having a plurality of various widths, all said widths being in the range of from about 3 inches to about 8 inches and an adhesive for adhering the strips to a wall in a random width, parallel relationship one to another.

4,442,152
MARKER MEMBER
Arthur G. Kirk, 2408 S. Ridgeland Ave., Berwyn, Ill. 60402
Filed Jun. 1, 1982, Ser. No. 383,749
Int. Cl.[3] C09J *7/02*
U.S. Cl. 428—77 5 Claims

1. An article for marking the location of structural members prior to the installation of a wall or floor panel, comprising an elongated reaction-responding member and an adhesive associated with said reaction-responding member, wherein said reaction-responding member comprises a flexible carrier, an adhesive layer supported on one side of said carrier, and magnetic particles incorporated in said adhesive layer, including a further adhesive layer supported on the other side of said flexible carrier.

4,442,153

LONGITUDINALLY DIVIDED CABLE SLEEVE OF THERMO-PLASTIC SYNTHETIC MATERIAL WITH A SHAPE MEMORY

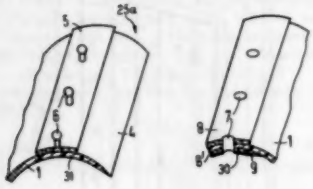
Hans-Jürgen Meltsch, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 20, 1981, Ser. No. 313,342

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048051

Int. Cl.³ F16L *11/12;* **B65D** *65/42;* **H02G** *15/18;* **B32B** *3/02*

U.S. Cl. 428—99 **23 Claims**



1. In a longitudinally divided cable sleeve having a strip-like sleeve member composed of a thermoplastic synthetic member having a shape memory, said sleeve member having longitudinal edges and closure means for closing said edges together so that the edges can be sealed together after the cable sleeve has been wrapped around an object and the sleeve is shrinkable onto the enclosed object when heat is applied, the improvements comprising the closure means having means for overlapping a slot between the two edges and a mechanical reinforcement for the edges, said reinforcement including a reinforcing element secured to the cable sleeve adjacent each longitudinal edge with at least a portion of said edges overlapping, each of the edges with the reinforcing element being more thermally stable than the remainder of the sleeve member when subjected to the heat for shrinking the sleeve onto an object, said closure means having coacting closure elements comprising headed pins having heads adjacent one end being provided on one reinforcing element and apertures for receiving said headed pins being provided in the other reinforcing element, said apertures and headed pins being constructed to form a mutual locking of the two reinforcing elements and overlapping edges together when the pins are inserted into said apertures to hold the overlapping edges together.

4,442,154

LONGITUDINALLY SPLIT SLEEVE

Johann Förtsch, Kronach-Friesen, and Hans-Jürgen Meltsch, Germering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,749

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135766

Int. Cl.³ B32B *3/06;* **F16L** *9/00, 33/00;* **H02G** *13/06*

U.S. Cl. 428—99 **38 Claims**

1. In a longitudinally split sleeve having a strip like sleeve member composed of a thermo-plastic synthetic member having a shape memory, said sleeve member having longitudinal edges with at least one edge having a reinforcing member, said sleeve having closure means for closing said edges together in an overlapping joint so that the edges can be sealed together after the sleeve has been wrapped around an object and the sleeve is shrunk onto the enclosed object by a result of an application of heat, said closure means comprising radially extending elements disposed along one edge of said sleeve member and being engaged in spaced apertures provided along the other edge of the joint, the improvements comprising said radially extending elements being integral radially extending tabs formed from the material adjacent said one edge, said tabs being cut from said material and being folded to the radially extending position along a fold line extending at an incline angle relative to the edge of the sleeve member.

4,442,155

LONGITUDINALLY DIVIDED CABLE SLEEVE OF SHRINKABLE MATERIAL HAVING CLOSURE ELEMENTS ALONG ITS LONGITUDINAL EDGES

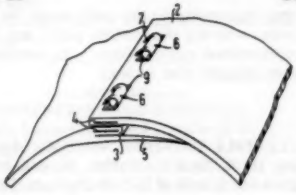
Johann Foertsch, Kronach-Friesen, and Hans-Juergen Meltsch, Germering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, United Kingdom

Filed Nov. 24, 1982, Ser. No. 444,345

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1981, 3148135

Int. Cl.³ B32B *3/06;* **F16L** *9/00;* **H02G** *13/06;* **F16L** *33/00*

U.S. Cl. 428—99 **34 Claims**



1. In a longitudinally divided cable sleeve having a strip-like sleeve member composed of a heat-shrinkable material, said sleeve member having two longitudinal edges with reinforcing inserts to form first and second edges with reinforced portions and coacting closure means for closing said edges together comprising closure elements mounted along the first edge and being engaged in openings formed in the reinforced portion of the second edge to hold the two edges in a closed position, the improvements comprising each of the elements having link means for mounting the element in axially extending slots in the area of the reinforced portion of the first edge, each element having abutment means for limiting the depth of insertion of the link means into each slot, each element having a projecting closure part for being inserted through an opening of the second edge with each projecting closure part having at least one latching element extending therefrom so that when the openings of the second edge are placed on the closing elements, said latching elements engage the outer surface adjacent each opening to prevent accidental and unintentional disassembly of the closure means.

4,442,156

WINDOW WEATHER STRIPPING AND THE MANUFACTURING METHOD

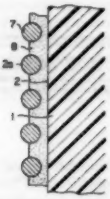
Toshiaki Yamaguchi, Chiba, Japan, assignor to Kinugawa Rubber Industrial Co., Ltd., Chiba, Japan

Filed Apr. 22, 1982, Ser. No. 370,675

Claims priority, application Japan, Apr. 23, 1981, 56-61624; Apr. 23, 1981, 56-61625; Apr. 23, 1981, 56-61626; Apr. 23, 1981, 56-58804[U]; Jun. 16, 1981, 56-88441[U]; Jun. 16, 1981, 56-88442[U]

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—142 5 Claims



1. Window weather stripping for sealing a gap between a movable glass and a window frame which comprises:

a strip of elastic material having a microscopically rough surface on at least the surface of said strip along which the movable window glass slides, said rough surface comprising nylon particles bonded to said strip surface by a paint consisting essentially of nylon particles contained in a nylon-based bonding agent.

4,442,157

FIREPROOFING COMPOSITION AND DOOR RABBET COATED THEREWITH

Hans-Norbert Marx, Buchl-Weitenung, and Reimer Göttsche, Baden-Baden, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 12,722, Feb. 16, 1979, abandoned. This application Dec. 29, 1980, Ser. No. 220,964

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807697

Int. Cl.³ B32B *3/00*; C09D *5/18*; C09K *3/28*

U.S. Cl. 428—173 3 Claims

1. A mechanically stable fireproofing composition which is heat-formable to more than 10 times its original volume to form a mechanically stable insulating layer and which consists essentially of

(a) from 15 to 40% by weight of a phenolic resin, which is thermosetting by itself,

(b) from 25 to 45% by weight of an ammonium salt,

(c) from 10 to 20% by weight of a carbohydrate and/or a polyhydric alcohol,

(d) from 15 to 40% of a thermally decomposable organic nitrogen compound, selected from the group consisting of urea, melamine, and dicyandiamide, and

(e) from 1 to 10% of a binder from the group consisting of the water-soluble, solvent-soluble and water-dispersible vinyl polymers, the percentages given being based on the solids content of the composition.

3. A door rabbet having thereon a coating of mechanically stable fireproofing composition as recited in claim 1, which is heat-foamable to at least 10 times its original volume, and which has sufficient mechanical strength to remain whole when the door is slammed, to prevent passage of flames in the event of a fire.

4,442,158

FOOD PACKAGE OF PLASTIC LAMINATE

James A. Distler, Cloudsley Co. - 470 W. Northland Rd., Cincinnati, Ohio 45240

Filed Jun. 1, 1981, Ser. No. 268,823

Int. Cl.³ B32B *7/02*

U.S. Cl. 428—195 4 Claims

1. A plastic laminate especially adapted for use as a food package, said laminate comprising in sequential layers from exterior to interior, a polypropylene layer, a polyvinylidene chloride polymer layer, and an ionomer resin layer as the inside layer of the package.

4,442,159

MAGNETIC RECORDING MEDIUM

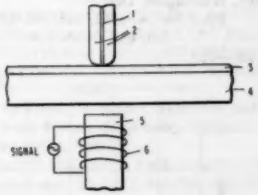
Shin-ichiro Dezawa; Goro Akashi, and Tatsuji Kitamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 26, 1982, Ser. No. 382,336

Claims priority, application Japan, May 26, 1981, 56-79685

Int. Cl.³ G11B *5/68*, *5/70*

U.S. Cl. 428—212 8 Claims



1. A magnetic recording medium which comprises

(a) a non-magnetic support;

(b) a magnetic layer comprising magnetic particles dispersed in a binder and said magnetic layer comprising two or more layers,

(i) the layer(s) other than the topmost layer containing needle-shaped magnetic particles, and

(ii) the topmost layer containing plate-shaped hexagonal ferrite magnetic particles having a mean diameter of 0.1 μm to 20 μm, a coercive force of 300 to 3,000 oersteads, and satisfying the following relationship

$$K/(2\pi M_s^2) \geq 1$$

wherein K represents the magnetic anisotropy constant in the direction perpendicular to the major plane of an individual particle plate, M_s represents the saturation magnetization value and π is the ratio of the circumference of a circle to its diameter, and which have axes of easy magnetization perpendicular to their individual plate planes and whose plate planes are oriented substantially parallel to the surface of the magnetic layer.

4,442,160

ELECTROSTATIC RECORDING MEDIUM HAVING AN ELECTRICALLY CONDUCTIVE LAYER CONTAINING PRE-DISPERSED ELECTRICALLY CONDUCTIVE CARBON BLACK AND POLYURETHANE BINDER RESIN

Hirotaka Toba; Masanori Itoh, both of Himeji; Keita Nakano, Ebina; Shoji Wakoh, Ebina; Toshihiko Toyoshima, Ebina, and Hidemasa Todo, Ebina, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka and Fuji Xerox Co., Ltd., Tokyo, both of, Japan

Continuation-in-part of Ser. No. 274,683, Jun. 17, 1981, Pat. No. 4,410,584. This application Jul. 13, 1982, Ser. No. 397,943

Claims priority, application Japan, Jul. 21, 1981, 56-114051

Int. Cl.³ B32B *5/00;* **G03G** *5/02*

U.S. Cl. 428—215 **10 Claims**

1. An electrostatic recording member adapted to be used for repetitive formation and development of electrostatic latent images, followed by transfer of the developed images from said member to successive separate paper sheets, said member consisting essentially of:

a support;

an electrically conductive layer laminated directly on top of said support, said electrically conductive layer consisting essentially of a mixture of fine powder of predispersed electrically conductive carbon black uniformly dispersed in a polyurethane binder resin prepared by reacting a polyester with a polyisocyanate, said electrically conductive layer having a surface resistivity in the range of from 10^6 to 10^8 ohms; and

a non-photoconductive recording layer laminated directly on top of said electrically conductive layer, said recording layer consisting essentially of a dielectric material having a volume resistivity of at least 10^{12} ohm.cm.

4,442,161

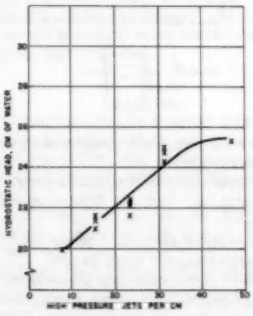
WOODPULP-POLYESTER SPUNLACED FABRICS

Birol Kirayoglu, Wilmington, and Dimitri P. Zafiroglu, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 4, 1982, Ser. No. 439,209

Int. Cl.³ D04N *1/46*

U.S. Cl. 428—219 **10 Claims**



1. In a process for producing a nonapertured spunlaced nonwoven fabric from an assembly consisting essentially of woodpulp and synthetic organic fibers wherein the assembly, while on a supporting member is treated with fine, columnar jets of water which issue from banks of orifices having diameters in the range of 0.05 to 0.13 millimeters and provide a sufficient total energy-impact product (E×I) to entangle the fibers and form them into the spunlaced fabric, the improvement which comprises for increasing the liquid-barrier characteristics of the fabric, performing the entanglement treatment with at least one third of the total E×I being furnished through orifice banks having orifice supply pressures of at least 6900 kPa and providing at least 23 jets per centimeter of fiber assembly being treated.

4,442,162

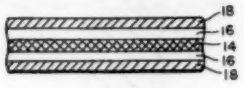
CHEMICAL AND BIOLOGICAL RESISTANT MATERIAL AND METHOD OF FABRICATING SAME

Frank E. Kuester, DeLand, Fla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 9, 1981, Ser. No. 309,899

Int. Cl.³ B32B *7/00;* **B65B** *55/00*

U.S. Cl. 428—245 **18 Claims**



1. A laminated chemical and biological resistant, flexible camouflage material comprising:

a base fabric of woven construction forming a support layer for said material;

a flexible base coat of polyvinyl chloride material laminated to at least one side of said base fabric; and

a flexible top coat laminated to said base coat, said top coat having camouflage properties and comprising a chemical and biological resistant material selected from the group consisting of aliphatic polyurethanes, polyvinylidene chloride, butyl rubber, fluorocarbon polymers, nitrile rubber.

8. A process of fabricating a laminated chemical and biological resistant, flexible camouflage material comprising:

providing a support layer for said material in the form of a base fabric of woven construction;

applying to at least one side of said base fabric a flexible coat of polyvinyl chloride material; and

applying to said base coat a flexible top coat of chemical and biological resistant camouflage material, selected from the group consisting of aliphatic polyurethanes, polyvinylidene chloride, butyl rubber, fluorocarbon polymers, nitrile rubber.

4,442,163

RESORCINOL-FILLER PREPARATION, PROCESS FOR THE PRODUCTION AND USE OF THE SAME

Gerhard Kühner, Hanau; Siegfried Wolff, Bornheim-Merten, and Lothar Rothbühr, Hürth-Hermülheim, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 213,475, Feb. 3, 1981, Pat. No. 4,381,949. This application Jan. 21, 1983, Ser. No. 459,983

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1980, 3003934

Int. Cl.³ C08K *3/04, 5/13;* **B32B** *7/00*

U.S. Cl. 428—262 **19 Claims**

1. A vulcanizable rubber composition having improved adhesion to metal, glass and textile fibers other than metal or glass comprising a vulcanizable rubber and distributed therethrough a resorcinol-filler composition consisting essentially of homogeneously distributed resorcinol and at least one carbon black, the amount of carbon black being 70 to 30% and the amount of resorcinol being 30 to 70%.

17. An article of manufacture comprising a fabric made of polyethylene glycol terephthalate adhered to the vulcanizate of a vulcanizable rubber composition according to claim 1.

4,442,164

FIBROUS COMPOSITE MATERIALS AND THE PRODUCTION AND USE THEREOF

Peter J. Briggs, Cheadle Hume; Kevin McAloon, Appleton Thorn, and Graham R. Rideal, Handbridge, all of England, assignors to Imperial Chemical Industries Ltd., London, England

Continuation of Ser. No. 281,104, Jul. 7, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 545,103

Claims priority, application United Kingdom, Jul. 11, 1980, 8022713

Int. Cl.³ B32B 5/16; D02G 3/00

U.S. Cl. 428—283 14 Claims

1. A fibrous composite material of essentially two-dimensional configuration consisting essentially of at least about 15% by weight combustible fibers and at least about 20% by weight lamallae of chemically delaminated vermiculite, the lamallae having a thickness of less than 0.5 micron and an aspect ratio of at least 10, substantially all of the lamallae being of size below 50 microns and the fibers being bonded together by the vermiculite.

4,442,165

LOW-DENSITY THERMALLY INSULATING CARBON-CARBON SYNTACTIC FOAM COMPOSITE

Joseph J. Gebhardt, Malvern, and Paul W. Juneau, Jr., Norristown, both of Pa., assignors to General Electric Co., Philadelphia, Pa.

Filed Mar. 26, 1981, Ser. No. 247,703

Int. Cl.³ B32B 5/18, 7/02, 9/00

U.S. Cl. 428—307.7 2 Claims

1. A low-density, thermally insulating composite comprising:

(a) a reinforced, carbon-carbon syntactic foam material exhibiting low thermal conductivity and low density characteristics, said foam material further comprising a thermosetting resin matrix and a pyrolyzed mixture of carbon fibers and hollow carbon spheres within said thermosetting resin matrix;

(b) pyrolytic carbon covering and penetrating into at least a portion of said foam material; and,

(c) a layer of pyrolytic graphite on at least a portion of said pyrolytic carbon covered and penetrated syntactic foam material.

4,442,166

CERMET FILM SELECTIVE-BLACK ABSORBER

John C. C. Fan, Chestnut Hill, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 94,370, Nov. 15, 1979, Pat. No. 4,312,915, which is a continuation of Ser. No. 837,434, Jan. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 624,701, Apr. 7, 1976, abandoned. This application Jan. 21, 1982, Ser. No. 341,376

The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.

Int. Cl.³ B32B 5/16, 15/04; F24J 3/02

U.S. Cl. 428—323 2 Claims

1. A selective black absorber capable of highly absorbing solar energy and only slightly emitting infrared energy comprising:

a substrate comprising a layer of material which is an electrical insulator and a low infrared emissivity film coating formed thereon and said substrate being electrically nonconductive in the direction normal to the layer of said substrate,

a cermet film deposited on the film coating of said substrate, said cermet film comprising metal particles having diameters much less than the wavelength of solar energy to be absorbed to cause the particles to be good solar energy absorbers,

said cermet film having a thickness and composition such that it has high solar absorptance and low infrared thermal emissivity as a coating on said substrate having low infrared emissivity.

4,442,167

WEATHER RESISTING EXTRUDED RUBBERY ARTICLES HAVING ON THE SURFACE THEREOF A THIN LAYER OF A COLORED RUBBERY MATERIAL

Tadanobu Iwasa, Ichinomiya, and Mituo Ushida, Inazawa, both of Japan, assignors to Toyoda Gosei Kabushiki Kaisha, Nishikasugaigun, Japan

Filed Jun. 29, 1982, Ser. No. 393,517

Int. Cl.³ B32B 5/16, 3/20

U.S. Cl. 428—323 8 Claims

1. A weather-resisting extruded rubbery article based on a carbon black-incorporated EPDM rubber substrate having on the surface thereof a thin, smooth layer of a colored rubbery material of a smooth or suede-like appearance integrally formed on the substrate by extrusion molding, wherein the colored rubbery material has been derived from 75–0% by weight of EPDM rubber and 25–100% by weight of a graft copolymer of EPDM rubber and vinyl chloride together with one or more coloring fillers.

4,442,168

COATED SUBSTRATE COMPRISING A CURED TRANSPARENT ABRASION RESISTANT FILLED ORGANO-POLYSILOXANE COATINGS CONTAINING COLLOIDAL ANTIMONY OXIDE AND COLLOIDAL SILICA

William H. White, La Puente; William C. Harbison, and Gary L. Nelson, both of Lake Forest, all of Calif., assignors to Swedlow, Inc., Garden Grove, Calif.

Division of Ser. No. 309,423, Oct. 7, 1981, Pat. No. 4,390,373. This application Apr. 28, 1983, Ser. No. 489,697

Int. Cl.³ B32B 27/30, 5/16; C09K 3/14

U.S. Cl. 428—331 27 Claims

1. An article manufactured by applying to at least one surface of a substrate a coating composition which forms a transparent, abrasion-resistant coating upon curing, said coating composition comprising an effective abrasion resisting amount of a colloidal dispersion containing colloidal silica and an effective abrasion resistance enhancing amount of colloidal antimony oxide in a weight ratio of less than or equal to about 30:70, antimony oxide:silica, in a water-alcohol solution of the partial condensate of $R(Si(OH)_3)$ wherein R is an organic radical, and curing said applied coating composition.

4,442,169

MULTIPLE COATED CUTTING TOOL AND METHOD FOR PRODUCING SAME

Donald E. Graham, St. Clair Shores, Mich., assignor to General Electric Company, Schnectady, N.Y.

Filed Jan. 28, 1982, Ser. No. 343,545

Int. Cl.³ B32B 15/04

U.S. Cl. 428—332 13 Claims

1. An article comprising:

(i) a cemented carbide or aluminum base solid ceramic sub-

strate having aluminum oxide on at least portions of the surface thereof, said aluminum oxide forming a first surface;

(ii) an intermediate layer of an oxide of titanium adjacent at least a portion of said first surface; and

(iii) an outer layer of at least one of titanium nitride, titanium carbide and titanium carbonitride adjacent at least a portion of said intermediate layer.

2. The article as defined in claim 1 wherein said intermediate layer contains TiO.

3. The article as defined in claim 2 wherein said intermediate layer is less than or equal to approximately 1 micron in thickness.

4,442,170

SECURITY DOCUMENT WITH SECURITY FEATURES IN THE FORM OF LUMINESCING SUBSTANCES

Wittich Kaule, Gauting; Gerhard Schwenk, Puchheim, and Gerhard Stenzel, Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH., Munich, Fed. Rep. of Germany

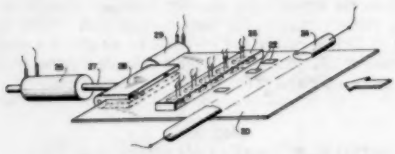
PCT No. PCT/DE81/00080, 371 Date Oct. 23, 1981, 102(e) Date Oct. 23, 1981, PCT Pub. No. WO81/03509, PCT Pub. Date Dec. 10, 1981

PCT Filed May 29, 1981, Ser. No. 314,840

Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020601

Int. Cl.³ B32B *21/04*; G01N *21/38*

U.S. Cl. 428—333 16 Claims



1. Security document with security features comprising:

a substrate material; and

a luminescing substance combined with said carrier material, said luminescing substance having a known excitation spectrum and a known emission spectrum wherein at least a portion of said excitation spectrum and at least a portion of said emission spectrum are contained in a narrow band of wavelengths and at least a portion of said excitation spectrum overlaps at least a portion of said emission spectrum in said narrow wavelength band whereby said luminescing substance operates in a quasi-resonant mode.

4,442,171

MAGNETIC RECORDING MEDIUM

Masami Sato; Goro Akashi; Yasutoshi Okuzawa, and Toshimitu Okutu, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

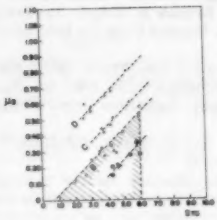
Filed Mar. 9, 1982, Ser. No. 356,285

Claims priority, application Japan, Mar. 12, 1981, 56-35833

Int. Cl.³ G11B *5/70*

U.S. Cl. 428—336 6 Claims

1. A magnetic recording medium comprising a non-magnetic flexible substrate, a magnetic layer provided on the surface of said substrate and containing ferromagnetic grains dispersed in a binder, and a back layer provided on the back surface of said substrate, wherein the stiffness (S_{TD}) of said magnetic recording medium is 6.0 or less, the surface roughness of said back layer is substantially 0.038 microns or less, the magnetic recording medium has a thickness of substantially 15.5 microns or less, and the friction coefficient (μ_B) of said back layer with respect to the axial direction of a loading post satisfies the condition:



$$0 \leqq \mu_B \leqq 0.1 S_{TD} - 0.05.$$

4,442,172

INK JET RECORDING SHEET

Hiroyo Oshima; Matsukuma Daisaku; Kojima Yutaka; Kobayashi Yukio, and Nagai Koichi, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,625

Claims priority, application Japan, Jul. 10, 1981, 56-106970

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—342 7 Claims

1. Ink jet recording sheet characterized in that 1 g/m^2 or more (as solid content) of water-soluble polymer is coated onto the surface of a base sheet comprising a uniform mixture of 15–45 wt. parts of synthetic silicate and 0.1–1 wt. parts of a wet strength additive and 2–10 wt. parts of glass fiber of 5–7 μm diameter and 2–4 mm length with respect to 100 wt. parts of wood pulp.

4,442,173

NOVEL WATER-ABSORBING ACRYLIC FIBERS

Shinsuke Takegami, Ootsu; Kaoru Ban, and Mitsuru Wakitani, both of Okayama, all of Japan, assignors to Japan Exlan Company, Limited, Osaka, Japan

Division of Ser. No. 231,626, Feb. 5, 1981, abandoned. This application Jun. 11, 1982, Ser. No. 387,682

Claims priority, application Japan, Feb. 14, 1980, 55-17360

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—372 12 Claims

1. Water-absorbing acrylic fibers consisting of more than 90 weight % on an acrylonitrile polymer and less than 10 weight % of a water-absorbing resin, which fibers have a surface resistance not larger than $1\times10^9\Omega$ and a water-holding ratio not less than 25%, the decrease in the water-holding ratio of the fibers after a dry heat treatment at 120° C. for one hour being not more than 10%, and which fibers are produced by the steps of wet-spinning a spinning solution of an acrylonitrile polymer mixed with a water-absorbing resin, water-washing and stretching the resulting fibers, dry-compacting the fibers if desired, subjecting the fibers to a wet-heat relaxing treatment, imparting to the fibers less than 1.5%, by weight of the fibers, of a spinning oil, and drying the fibers in a temperature range of from 105° to 170° C., said water-absorbing resin having 1 to 15 cross-links for 400 repeating units of the polymer forming said resin, and being a resin having a particle diameter less than 0.5μ in absolute dryness and a degree of water-swellability within the range of from 20 to 300 cc/g.

7. A process of producing water-absorbing acrylic fibers consisting of more than 90 weight % of an acrylonitrile polymer and less than 10 weight % of a water-absorbing resin, which fibers have a surface resistance not larger than $1\times10^9\Omega$ and a water-holding ratio not less than 25%, the decrease in the water-holding ratio of the fibers after a dry heat treatment at 120° C. for one hour being not more than 10%, said process

comprising the steps of wet-spinning a spinning solution of an acrylonitrile polymer mixed with a water-absorbing resin, water-washing and stretching the resulting fibers, dry-compacting the fibers if desired, subjecting the fibers to a wet-heat relaxing treatment, imparting to the fibers less than 1.5%, by weight of the fibers, of a spinning oil, and drying the fibers in a temperature range of from 105° to 170° C., said water-absorbing resin having 1 to 15 cross-links for 400 repeating units of the polymer forming said resin, and being a resin having a particle diameter less than 0.5μ in absolute dryness and a degree of water-swellability within the range of from 20 to 300 cc/g.

4,442,174

RUBBER SEALING MEMBER

Kurt Neumann, Wassenberg, and Wolfgang Dietrich, Cologne, both of Fed. Rep. of Germany, assignors to Wilhelm Leeser Gummi-und Kunststoffverarbeitung GmbH & Co., KG, Wegberg-Dalheim, Fed. Rep. of Germany

Filed Mar. 8, 1983, Ser. No. 473,232

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208794

Int. Cl.³ D02G *3/00*; B32B *27/06*

U.S. Cl. 428—376 **7 Claims**

1. A cellular compressible elongated rubber member having a sheathing of plastic material, the thickness of said sheathing being less than the cross-sectional dimension of said member, and said sheathing enclosing said member without being fixedly connected thereto.

4,442,175

CELLULAR CERAMIC BODIES AND METHOD MAKING SAME

James E. Flannery; Robert D. Shoup, and Dale R. Wexell, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,670

Int. Cl.³ C03B *19/10*

U.S. Cl. 428—404 **32 Claims**

1. A cellular ceramic body of high mechanical strength and exhibiting a density of less than 15 lbs./ft³ consisting essentially of the ion exchange product of a large cation donor and a synthetic, lithium and/or sodium, water-swelling mica wherein the lithium and/or sodium ions on the mica surface are essentially replaced by the large cations, and the mica being selected from the group of fluorhectorite, hydroxyl hectorite, boron fluorphlogopite, hydroxyl boron phlogopite, and solid solutions among those and between those and other structurally-compatible species selected from the group of talc, fluortalc, polylithionite, fluorpolylithionite, phlogopite, and fluorphlogopite.

4,442,176

HEAT-SENSITIVE RECORDING SHEET

Kazuya Nagaoka, and Sigeru Yoshii, both of Yokohama, Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Aug. 19, 1983, Ser. No. 524,666

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—208 **10 Claims**

1. A heat-sensitive recording sheet having a color-forming layer comprising a colorless or pale-colored chromogenic dyestuff and a hydroxyphthalic acid diester having a melting point of from about 60° to about 120° C.

4,442,177

ALKYL ETHER METHYLOLMELAMINE COATING COMPOSITION, COATING PROCESS AND TRANSPARENT PRODUCT

Akinori Noda; Seiichi Miyasaka, and Hiroshi Kawahara, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Apr. 1, 1981, Ser. No. 250,071

Claims priority, application Japan, Apr. 4, 1980, 55-43527

Int. Cl.³ B32B *27/42*; B05D *3/02*

U.S. Cl. 428—412 **13 Claims**

1. A coating composition which comprises:

(A) an alkyl ether methylolmelamine in which a part or whole of methylol groups of methylolmelamine are converted into alkyl ether methylol groups;

(B) a polyhydric alcohol having 2 or more hydroxyl groups; and

(C) a dispersion of colloidal silica having about 3 to 4 silanol groups per 100 square Angstroms and which can be condensed with one or more of the components (A), (B), or (C); and

(D) a solvent.

4,442,178

SOS SUBSTRATE FOR SEMICONDUCTOR DEVICE

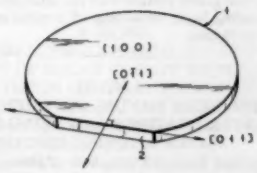
Minoru Kimura, Yokohama, and Bunzi Takeuchi, Sagamihara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 24, 1982, Ser. No. 422,371

Claims priority, application Japan, Nov. 25, 1981, 56-188842

Int. Cl.³ H01L *21/20*

U.S. Cl. 428—446 **2 Claims**



1. An SOS substrate for a semiconductor device, comprising:

a single crystal sapphire plate which has a surface with an index of plane (1012);

an epitaxial silicon layer which has a surface with an index of plane (100) and which is formed on the surface of said sapphire plate; and

an end face on said SOS substrate, said end face being inclined by an angle of 2.1° to 2.2° with respect to the [011] or [011] crystallographic direction of said silicon.

4,442,179

HEAT-SENSITIVE RECORDING PAPER

Akira Igarashi, and Sukenori Nakamura, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Shizuoka, Japan

Filed Oct. 15, 1982, Ser. No. 434,661

Claims priority, application Japan, Oct. 16, 1981, 56-165263

Int. Cl.³ B41M *5/18*

U.S. Cl. 428—220 **9 Claims**

1. A heat sensitive recording paper which has on a paper support base a heat-sensitive recording layer having received a surface treatment in such a state that said recording paper comes to contain moisture in a proportion ranging from 5 wt% to 12 wt% by drying after the coating of a heat-sensitive recording layer, said surface treatment being effected by passing

the recording paper through a pressure applying means, which is constructed by a metal roller heated up to a temperature of 40° C. to 60° C. and an elastic roller, with the recording layer brought into a face-to-face contact with the metal roller.

4,442,180

SINTERED BODY FOR USE IN A CUTTING TOOL AND THE METHOD FOR PRODUCING THE SAME

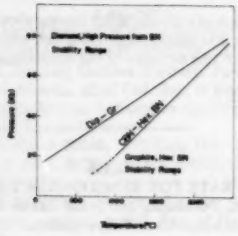
Akio Hara, and Shuji Yazu, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 36,989, May 7, 1979, Pat. No. 4,293,618. This application May 8, 1981, Ser. No. 262,027

Claims priority, application Japan, May 14, 1978, 53-58546

Int. Cl.³ C22C *29/00*; B22F *7/06*

U.S. Cl. 428—551 **10 Claims**



1. In a diamond sintered body or high pressure form boron nitride sintered body for use in a cutting tool, the improvement wherein said sintered body is supported by cermet in which carbide crystals in the form of $(Mo, W)_1C_x$ wherein x is within the range of 0.8 to 0.98, chiefly consisting of molybdenum are bonded by iron group metals with the interposition of an intermediate bonding layer consisting of a metal carbide less than 0.1 mm in thickness.

4,442,181

STEEL STRIP HAVING DIFFERENTIATED MULTILAYER COATINGS AND BEING USEFUL FOR MANUFACTURING OF CANS

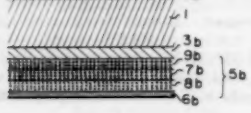
Takao Saito, and Kazuya Ezure, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,349

Claims priority, application Japan, Apr. 23, 1981, 56-61767; Jul. 17, 1981, 56-111639

Int. Cl.³ B21D *51/26*; B32B *15/04, 15/18*; C25D *5/12*

U.S. Cl. 428—623 **8 Claims**



1. A differential multilayer-coated steel strip useful for the manufacture of cans in which the surface coatings are different from each other, said steel strip consisting of:

(A) a steel strip substrate;

(B) a 3-layered first surface coating formed on a surface of said steel strip substrate consisting of

(a) a plated nickel first base layer formed on said surface of said substrate and consisting of from 10 to 5,000 mg/m² of plated nickel,

(b) a plated tin intermediate layer formed on the surface of said first base layer and consisting of from 50 to 11,000 mg/m² of plated tin, and

(c) a chromium-treated first surface layer formed on the surface of said intermediate layer and having a weight of from 3 to 50 mg/m², in terms of metallic chromium; and

(C) a 2-layered surface coating formed on the other surface of said steel strip substrate consisting of

(d) a plated nickel second base layer formed on said other surface of said substrate and consisting of from 10 to 5,000 mg/m² of plated nickel, and

(e) a chromium-treated second surface layer formed on the surface of said second base layer and having a weight of from 3 to 50 mg/m², in terms of metallic chromium.

4,442,182

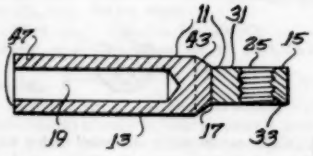
ONE-PIECE, COMPOSITE ELECTRICAL CONNECTOR

John E. Chart, Edinboro, Pa., assignor to Teledyne Penn-Union, Edinboro, Pa.

Filed May 26, 1982, Ser. No. 382,154

Int. Cl.³ H01R *11/00*; H02G *15/00*

U.S. Cl. 428—654 **15 Claims**



1. A one-piece, composite electrical connector fabricated from at least two portions of electrically conductive metal alloys, comprising at least a first one of said portions being a precipitation hardenable metal alloy which is thermally hardenable, and at least a second one of said portions being a work hardenable metal alloy which is thermally softenable, said first and second portions being joined together by a bond along an interface common to said first and second portions, said first and second portions each having more than about 87% by weight of aluminum as a compositional element thereof for substantially precluding formation at said interface of intermetallic compounds harmful to said bond, said first portion being suitable for mechanical connection and being selected from the group consisting of AA 2011, AA 2014, AA 2017, AA 2018, AA 2024, AA 2025, AA 2036, AA 2117, AA 2124, AA 2218, AA 2219, AA 2319, AA 2618, AA 6003, AA 6005, AA 6053, AA 6061, AA 6063, AA 6066, AA 6070, AA 6101, AA 6105, AA 6151, AA 6162, AA 6201, AA 6253, AA 6262, AA 6351, AA 6463, AA 6951, AA 7001, AA 7005, AA 7008, AA 7011, AA 7072, AA 7075, and AA 7178, said second portion being crimpable and being selected from the group consisting of AA 1050, AA 1060, AA 1100, AA 1145, AA 1175, AA 1200, AA 1230, AA 1235, AA 1345, AA 1350, AA 3003, AA 3004, AA 3005, AA 3105.

4,442,183

ATMOSPHERIC OXYGEN ELEMENT WITH POSITIVE ELECTRODE PLATES

Bruno Siller, Freigasse 24, D-7090 Ellwangen, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,458

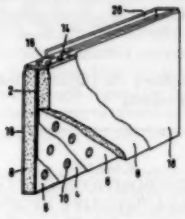
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040093

Int. Cl.³ H01M *4/00*

U.S. Cl. 429—29 **23 Claims**

1. A primary atmospheric oxygen element of reduced thickness comprising:

(a) positive electrode means providing a positive electrode,
(b) negative electrode means providing a negative electrode,
(c) an electrolyte solution containing manganese (II) chloride operatively associating said positive and negative electrode means,
(d) the electrolyte solution containing a thickening agent;
(e) container means containing said positive and negative electrodes and said electrolyte, wherein said positive electrode means comprises:
(i) a substantially planar carrier means for conducting an electric current therethrough, including a central planar metallic foil and planar conductive sheets substantially covering each side of said metallic foil;
(ii) air permeable positive electrode substance;



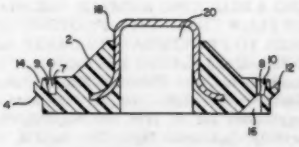
(iii) means adhering said positive electrode substance to said planar conductive sheets on each side of said carrier means;
(iv) rigid cover means covering a narrow front side of said positive electrode substance and said cover means defining a plurality of openings allowing the passage of air therethrough to said positive electrode means;
(v) coating means comprising a varnish substantially coating the exterior surfaces of said positive electrode means and securely assemblying said cover means and said positive electrode substance; and
(vi) protection means protecting said openings from being coated by said coating means.

4,442,184

DRY PATH GAS VENTING SEAL

Frank G. Spanur, Parma Heights, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1983, Ser. No. 480,695
Int. Cl.³ H01M 2/12
U.S. Cl. 429—54 **12 Claims**



1. A galvanic cell comprising a cylindrical container having an anode, a cathode separated from said anode by a separator, and electrolyte disposed therein; and a plastic closure member comprised of a resiliently deformable peripheral flange defined by an annular groove having an inner upstanding wall, a base, and an outer upstanding wall in the upper surface of the closure member, said resiliently deformable flange defining an annular notch which forms an outer sealing lip and an inner venting lip, which venting lip is deformed in part by the outer upstanding wall of the groove; said closure member defining at least one aperture that extends through the base of said annular groove, said closure member being compressed in said cylindrical container such that said venting lip is positioned over the inner surface of said groove and against the inner upstanding wall of the groove thereby forming a closed annular groove, and said closure operable such that when the internal pressure in the cell exceeds a predetermined limit the venting lip is momentarily deflected away from the inner upstanding wall of the groove to allow the release of such pressure from within the cell.

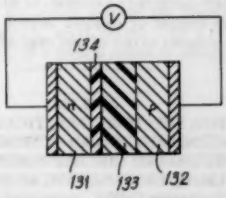
7. A method for production of galvanic cells having a reseal-able all-plastic vent path comprising the steps of:
(a) assembling within a cylindrical container an anode, a cathode separated from said anode by a separator, and disposing electrolyte therein;
(b) providing a plastic closure member comprised of a resiliently deformable peripheral flange defined by an annular groove having an inner upstanding wall, a base, and an outer upstanding wall in the upper surface of the closure member, said resiliently deformable flange having an outer diameter greater than the inner diameter of said cylindrical container and defining an annular notch which forms an outer sealing lip and an inner venting lip, which venting lip is defined in part by the outer upstanding wall of the groove; said closure member defining at least one aperture that extends through the base of said annular groove; and
(c) placing said closure member within the open end of said cylindrical container and compression sealing said container such that the venting lip of said closure member is positioned over the inner surface of said groove and against the inner upstanding wall of said groove thereby forming a closed annular groove and seal for the cell.

4,442,185

PHOTOELECTROCHEMICAL CELLS FOR CONVERSION OF SOLAR ENERGY TO ELECTRICITY AND METHODS OF THEIR MANUFACTURE

Terje Skotheim, East Patchoque, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 312,888, Oct. 19, 1981, Pat. No. 4,416,959, which is a continuation-in-part of Ser. No. 208,059, Nov. 18, 1980, Pat. No. 4,352,868. This application Jun. 9, 1982, Ser. No. 386,666
Int. Cl.³ H01M 6/36
U.S. Cl. 429—111 **11 Claims**



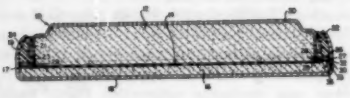
1. A photoelectric device comprising:
(a) a first layer of semiconductive material having a first band gap;
(b) a second layer of semiconductor material having a different band gap or of a metal;
(c) a layer of dry solid polymer electrolyte between said first and second layers; and
(d) a layer of a polymer blend of a highly conductive polymer and a solid polymer electrolyte between said dry solid polymer electrolyte and said first layer.

4,442,186

POROUS ANNULUS PROVIDING GAS CHANNELS BETWEEN ELECTRODE COMPARTMENTS

Lewis F. Urry, Columbia Station, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 28, 1982, Ser. No. 392,662
Int. Cl.³ H01M 2/18
U.S. Cl. 429—142 **11 Claims**



1. A sealed miniature galvanic cell comprising a housing having a container with a base, a sidewall and an open end, a cover disposed over the open end of the container and an electrically insulating sealing gasket compressively disposed between the container sidewall and the periphery of the cover, which housing contains a first electrode in electrical contact with the container, a second electrode in electrical contact with the cover, a separator interposed between the first and second electrodes and an electrolyte in ionic contact with the first and second electrodes; the improvement being a rigid annulus which is compressively disposed between the base of the sealing gasket and the separator, which annulus has portions defining a plurality of channels which provide means for the exchange of gaseous products around the separator and between the first and second electrodes.

4,442,187

BATTERIES HAVING CONJUGATED POLYMER ELECTRODES

Alan G. MacDiarmid, Drexel Hill; Alan J. Heeger, Wynnewood, and Paul J. Nigrey, Philadelphia, all of Pa., assignors to University Patents, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 129,439, Mar. 11, 1980, Pat. No. 4,321,114. This application Dec. 29, 1980, Ser. No. 220,496
Int. Cl.³ H01M 4/60
U.S. Cl. 429—213 **20 Claims**

1. A secondary battery comprising an anode means, a cathode means, and an electrolyte each of said electrode means including as an electrode-active material thereof a conjugated polymer which is characterized by having conjugated unsaturation along a main backbone chain thereof, said polymer being electrochemically oxidizable to a p-type doped material and electrochemically reducible to an n-type doped material, said electrolyte comprising a compound which is ionizable into one or more anionic or cationic dopant species capable of doping said polymer to one of said oxidized or reduced states.

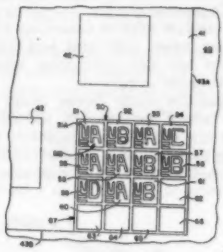
4,442,188

SYSTEM FOR SPECIFYING CRITICAL DIMENSIONS, SEQUENCE NUMBERS AND REVISION LEVELS ON INTEGRATED CIRCUIT PHOTOMASKS

Ping-Wang Chiang, Los Gatos, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Jan. 2, 1981, Ser. No. 222,254
Int. Cl.³ G03F 9/00
U.S. Cl. 430—5 **14 Claims**

11. In a set of photomasks adapted to be used during sequential photolithography processing steps in an overall process for manufacturing integrated circuit chips on a semiconductor wafer, a coding pattern for specifying critical dimensions and mask layer numbers for each of said photomasks comprising a preselected common subarea of each photomask free of circuit topography patterns and having formed thereon a prearranged marked array of geometric areas together with a preselected critical dimension pattern located in a prearranged one of said



geometric areas indicating the particular mask layer number for each of said photomasks.

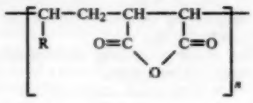
4,442,189

TONER COMPOSITIONS CONTAINING POLYANHYDRIDE RESINS

Chin H. Lu, and Christopher J. AuClair, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1983, Ser. No. 461,088
Int. Cl.³ G03G 9/08, 9/10
U.S. Cl. 430—45 **23 Claims**

1. A dry negatively charged toner composition comprised of resin particles, pigment particles and a polyanhydride charge enhancing composition of the formula:



wherein R is an alkyl group containing from about 6 carbon atoms to about 22 carbon atoms, and n is a number ranging from about 5 to about 2,000.

4,442,190

METHOD AND APPARATUS FOR IMAGE FORMATION UTILIZING A BLOCKING MEMBER FOR BLOCKING AN ION FLOW THROUGH A PHOTOSENSITIVE SCREEN TO PROVIDE A NON-IMAGE AREA

Tadayuki Kitajima, and Nobuhiro Kasama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 97,863, Nov. 27, 1979, abandoned. This application Jul. 21, 1981, Ser. No. 285,669
Claims priority, application Japan, Dec. 8, 1978, 53-151765
Int. Cl.³ G03G 13/02
U.S. Cl. 430—53 **11 Claims**

1. A method of forming an image by imagewise modulation of an ion stream, making use of an electric field formed on a photosensitive medium in a form of a screen mounted on an outer periphery of a drum-shaped frame, which is characterized by placing said screen photosensitive medium and an ion stream source in a spaced relation, wherein said source is located inside said drum-shaped frame, and by disposing a blocking member comprising an insulator or resistor material between said source and an inner periphery of said drum-shaped frame for preventing the ion stream from reaching a portion of said screen along a periphery of said frame, so as to form a non-image area on an image receiving member to which the ion stream is applied at the time of modulation.

4,442,191

ELECTROPHOTOGRAPHIC COPYING PROCESS FOR PRODUCING A PLURALITY OF COPIES

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,326
Claims priority, application Japan, Nov. 12, 1980, 55-158092
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.³ G03G 13/22
U.S. Cl. 430—55 4 Claims

1. An electrophotographic copying process for selectively forming a positive or a negative electrostatic latent image for producing a plurality of copies utilizing a photosensitive member for electrophotography which includes a conductive layer carrying a sequential lamination of a first and a second photoconductive layer thereon, the first photoconductive layer having a range of photoconductive response extending over a range of light rays from ultraviolet rays to visible light rays and defined as a first wavelength region, the second photoconductive layer being sensitive only to ultraviolet rays and defined as a second wavelength region, the process comprising a selective use of:

(A) a step of charging the photosensitive member simultaneously with an irradiation thereof with an image of an original which is formed by radiation in the first wavelength region, followed by a uniform exposure of the photosensitive member to radiation in the second wavelength region to trap a charge in a portion of the first photoconductive layer corresponding to a dark area of the image to form a positive electrostatic latent image; or

(B) a step of charging the photosensitive member simultaneously with an irradiation thereof with an image of an original which is formed by radiation of the first wavelength region, followed by an inverse charging which reduces the entire surface potential to substantially zero, subsequently followed by a uniform exposure of the photosensitive member to radiation in the second wavelength region to trap a charge in a portion of the first photoconductive layer corresponding to a bright area of the image to form a negative electrostatic latent image; and

(C) followed by the step of repeatedly subjecting the electrostatic latent image formed by the selective use of (A) or (B) to only a developing and a transfer step to produce a plurality of copies.

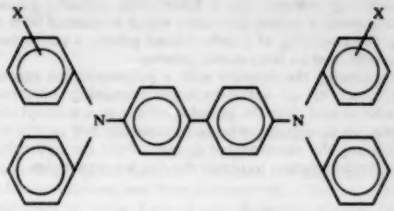
4,442,192

PHOTORESPONSIVE DEVICE CONTAINING AN ELECTRON DONATING LAYER

Damodar M. Pai, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 7, 1982, Ser. No. 385,628
Int. Cl.³ G03G 5/00, 5/04
U.S. Cl. 430—59 5 Claims

1. An improved layered overcoated photoresponsive imaging device useful in a xerographic imaging process with a single charging step, which device consists essentially of (1) a conductive supporting substrate, (2) a photoconductive composition layer comprised of selenium, selenium alloys, halogen doped selenium materials, halogen doped selenium alloys, metal free phthalocyanines, metal phthalocyanies, or vanadyl phthalocyanine (3) a hole trapping layer, and (4) an overcoating layer comprised of a composition capable of donating electrons to positive charges contained on the surface of the photoresponsive device, which overcoating layer contains a dispersion of a diamine of the following formula dispersed in an insulating organic resinous binder:



wherein X is selected from the group consisting of (ortho) CH_3, (meta) CH_3, (para) CH_3, ortho (Cl), meta (Cl) and para (Cl), which electron donating material is present in an amount of from about 10 percent by weight to about 75 percent by weight.

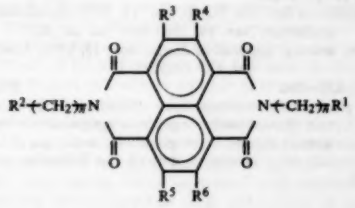
4,442,193

PHOTOCONDUCTIVE COMPOSITIONS AND ELEMENTS CONTAINING NAPHTHALENE BIS-DICARBOXIMIDE COMPOUNDS

Chin H. Chen; Ralph H. Young, and Michael Scozzafava, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,726
Int. Cl.³ G03G 5/09
U.S. Cl. 430—83 11 Claims

1. A photoconductive composition comprising a photoconductor and a 1,4,5,8-naphthalene bis-dicarboximide sensitizing compound having the structure:



wherein:

R^1 and R^2, which may be the same or different, represent aryl, or aryl substituted with alkyl, alkoxy, perfluoroalkyl or perfluoroalkoxy groups having 2 to 20 alkyl carbon atoms; sulfonyl; sulfone; sulfonamide; nitrile; or nitro groups;

R^3, R^4, R^5 and R^6, which may be the same or different, represent hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or halogen; and

n is 0 to 3.

4,442,194

PREPARATION OF ENCAPSULATED ELECTROSTATOGRAPHIC TONER MATERIAL USING GELATIN DERIVATIVE

Takeshi Mikami, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 1, 1982, Ser. No. 394,637
Claims priority, application Japan, Jul. 30, 1981, 56-119671
Int. Cl.³ B01J 13/02; G03G 9/08
U.S. Cl. 430—137 6 Claims

1. A process for the preparation of an electrostatographic toner material comprising encapsulated toner particles which comprises:

dispersing droplets of hydrophobic liquid having an average particle size in the range from about 0.5 to 1,000 microns

and containing pressure fixable adhesive core material including colorant into a hydrophilic colloidal solution containing a gelatin derivative which is selected from the group consisting of a carboxylated gelatin, a sulfonylated gelatin, and an isocyanated gelatin;

encapsulating the droplets with a polymerization reaction product of an active-hydrogen-containing compound with an acid chloride, a bischloroformate, a sulfonyl chloride, an isocyanate or an isothiocyanate; and

separating the encapsulated droplets from the hydrophilic colloidal solution to obtain the dry toner particles.

4,442,195

PHOTOSENSITIVE COMPOSITION AND ARTICLE WITH O-QUINONE DIAZIDE AND 6-MEMBERED CYCLIC ACID-ANHYDRIDE

Takeshi Yamamoto, and Kiyoshi Goto, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 395,976
Claims priority, application Japan, Jul. 15, 1981, 56-111000
Int. Cl.³ G03C *1/60, 1/54*
U.S. Cl. 430—191 **12 Claims**

1. A photosensitive composition comprising in admixture a photosensitive o-quinone diazide compound, an alkali-soluble resin and a 6-membered cyclic acid anhydride wherein said anhydride is present in an amount of 0.5 to 20% by weight.

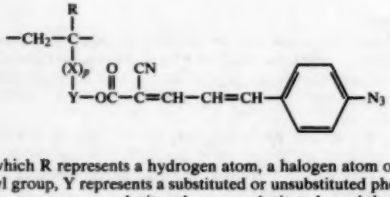
4,442,196

PHOTOSENSITIVE COMPOSITION

Akio Iwaki, Hachioji; Noriyasu Kita, Musashimurayama; Tatsuya Sasazawa, and Hiroyoshi Yamaguchi, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 29,350, Apr. 11, 1979, abandoned. This application Nov. 14, 1980, Ser. No. 207,087
Claims priority, application Japan, Apr. 12, 1978, 53-42940
Int. Cl.³ G03C *1/52*
U.S. Cl. 430—195 **5 Claims**

1. A photosensitive composition characterized by comprising as its main photosensitive ingredient a photosensitive polymeric compound having in its polymeric molecule at least 5 mole percent of a structural unit of the following general formula



in which R represents a hydrogen atom, a halogen atom or an alkyl group, Y represents a substituted or unsubstituted phenylene group or a substituted or unsubstituted naphthylene group, p is 0 or 1, and when p=1, X is a divalent organic group serving to join therethrough the carbon atom of the main chain of the polymer and the carbon atom of the aromatic ring expressed by Y and —CH_2—C— is part of the main chain of the polymer's compound.

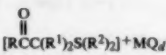
4,442,197

PHOTOCURABLE COMPOSITIONS

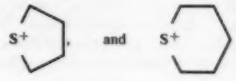
James V. Crivello, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,818
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—280 **7 Claims**

1. Compositions which are photocurable at wave lengths greater than 300 nm comprising a cationically polymerizable organic material and an effective amount of a photoinitiator having the formula



sensitized with an effective amount of a sensitizer selected from perylene, anthracene, mixture thereof, phenothiazene, where R is a member selected from $C_{(6-13)}$ monovalent aromatic organic radicals and substituted $C_{(6-13)}$ monovalent aromatic organic radicals, R^1 is a monovalent radical selected from hydrogen, $C_{(1-8)}$ alkyl and mixtures thereof, R^2 is a $C_{(1-13)}$ monovalent organic radical, or a divalent organic radical which can form a cyclic structure selected from the group consisting of



M is a metal or metalloid, Q is halogen and d is equal to 4–6.

4,442,198

POLYMER COMPOSITION HAVING TERMINAL ALKENE AND TERMINAL CARBOXYL GROUPS

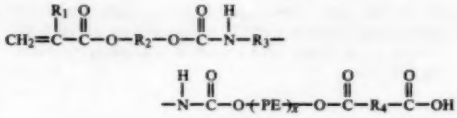
Jung-Hsien Tsao, Marietta, and Paul R. Hein, Atlanta, both of Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 225,809, Jan. 16, 1981, Pat. No. 4,422,914. This application Sep. 29, 1982, Ser. No. 426,390
Int. Cl.³ G03C *5/16, 1/70*
U.S. Cl. 430—311 **15 Claims**

1. A method for producing a photo resist comprising:

(a)

(1) providing a composition containing a polymer wherein the polymer consists essentially of a polymer having the formula:



wherein R_1 is hydrogen, methyl or ethyl, R_2 is alkyl of from 1 to 6 carbon atoms, R_3 is alkyl, aryl or alkylaryl, (PE) is selected from the group consisting of polyethers, polyesters and mixtures thereof, x is an integer of from 2 to 50 and R_4 is alkyl, alkene, aryl or alkyl or alicyclic.

(2) a photo initiator;

(b) coating said composition onto at least a portion of a printed circuit board blank; and

(c) contacting at least parts of said coated printed circuit board blank with actinic light radiation.

4,442,199

PATTERN FORMATION WITH NEGATIVE TYPE RESIST

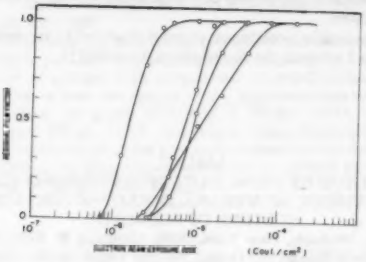
Kimio Shibayama, Sendai; Kingo Itaya, Tagajyo, and Teruo Fujimoto, Nagaoka, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Continuation of Ser. No. 289,282, Aug. 3, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 520,761
Claims priority, application Japan, May 16, 1981, 56-72896
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—323 **2 Claims**

1. A method of forming a pattern with a negative type resist

comprising forming a thin film made of a resist on a substrate and exposing the resist film imagewise to radiation;

developing and etching the product, where said resist is a diene polymer having a dispersion factor of about 1 obtained by a living polymerization of a diene monomer



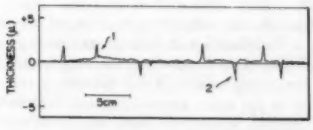
selected from the group consisting of isoprene and butadiene in the presence of an organometallic compound selected from the group consisting of butyl lithium, sodium naphthalene, sodium anthrasene, sodium biphenyl, phenyl isopropyl potassium, α-methyl styrene tetramer potassium and mixtures thereof.

4,442,200

PROCESS FOR THE PREPARATION OF PHOTOGRAPHIC RESIN-COATED PAPER

Yasuzi Asao, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd.

Filed Jul. 16, 1982, Ser. No. 398,824
Claims priority, application Japan, Jul. 24, 1981, 56-116170
Int. Cl.³ G03C *1/76, 1/86, 3/00*
U.S. Cl. 430—538 **9 Claims**



1. A process for the preparation of a photographic resin-coated paper which comprises coating a paper sheet with polyolefin resin of melt index in the range of 1.0–40 g./10 min. containing titanium dioxide powder coated with an alcohol having 2–18 carbon atoms and 3 methylol groups.

4,442,201

METHOD FOR PRODUCTION OF A SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Syun Takada; Takashi Kadowaki; Mitsuhiro Okumura, all of Odawara; Shinichi Nakamura, Tokyo, and Masaru Iwagaki, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Jul. 7, 1982, Ser. No. 395,998
Claims priority, application Japan, Jul. 7, 1981, 56-106412
Int. Cl.³ G03C *1/02*
U.S. Cl. 430—569 **8 Claims**

1. A method of producing a silver halide photographic emulsion coating liquid comprising the steps of:

(a) adding a first sensitizing dye to an emulsion containing silver halide particles, during the chemical ripening of the silver halide particles, to sensitize the silver halide particles; and

(b) adding a second sensitizing dye to the emulsion containing the sensitized silver halide particles, after the chemical ripening of the silver halides particles, to form a coating liquid.

4,442,202

POST-ACTIVATION TYPE DRY IMAGE FORMING MATERIAL

Tetsuo Shiga; Takeo Kimura; Yoshinobu Ito; Kageyasu Akashi; Minoru Akiyama, and Takeki Matsui, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 346,305, Feb. 5, 1982, abandoned, which is a continuation of Ser. No. 139,951, Apr. 14, 1980, abandoned. This application Feb. 28, 1983, Ser. No. 468,692
Claims priority, application Japan, Apr. 16, 1979, 54-45257
Int. Cl.³ G03C *1/02*
U.S. Cl. 430—600 **5 Claims**

1. A post-activation type dry image forming material possessing an improved storage stability comprising:

(I) a silver halide component reducible to free silver upon being exposed to light and consisting of silver iodide and silver bromide in a molar ratio of 50/50 to 95/5;

(II) a redox reactive composition comprising a non-photosensitive organic silver salt oxidizing agent and a reducing agent for silver ion, said redox reactive composition being capable of making a visual change according to a redox reaction of said composition, the redox reaction being initiated by heating said composition in the presence of free silver;

(III) an oxidizing agent for free silver comprising at least one member selected from the group consisting of a compound of divalent mercury, a compound of trivalent iron, a compound of divalent palladium, a compound of trivalent cobalt and a sulfinic acid compound respectively in amounts of 0.2 to 7 mole %, 0.01 to 1 mole %, 0.01 to 10 mole %, 0.01 to 1 mole % and 0.05 to 10 mole % based on said non-photosensitive organic silver salt oxidizing agent, said oxidizing agent for free silver having a capacity of oxidizing free silver and being capable of being rendered photosensitive by heating but, upon being exposed to light after said heating, being suppressed with respect to the capacity of oxidizing free silver and capable of catalytically promoting the redox reaction of said redox reactive composition; and

(IV) a photoreactive oxidizing agent comprising at least one bromo compound in which a carbon atom is bonded to a bromine atom and which is capable of generating a free radical of bromine upon light exposure and satisfies a requirement in a photoreaction test using a film containing said bromo compound, silver behenate and polyvinyl butyral such that (1) when the film is examined by X-ray diffractometry, the intensity of the peak due to silver bromide observed at 31.0° in terms of an angle of 2 θ in the X-ray diffraction pattern obtained by using, Cukα line is less than about 19 relative to 100 as the intensity of the peak due to silver behenate observed at 12.1° in terms of an angle of 2 θ as defined above; and (2) when the film is irradiated with a 20,000 luxes-light from a fluorescent lamp at 75° C. in an atmosphere of a relative humidity of 30 % for one hour, and then examined by X-ray diffractometry, the intensity of the peak due to silver bromide observed at 31.0° in terms of an angle of 2θ as defined above is about 10 or more relative to 100 as the intensity of the peak due to silver behenate observed at 12.1° in terms of an angle of 2 θ as defined above, said photoreactive oxidizing agent, upon being exposed to light, being capable of returning to the original state said oxidizing agent for free silver which has been reduced by serving to oxidize the free silver.

4,442,203

GENE AMPLIFICATION ASSAY FOR DETECTING TUMOR PROMOTERS

Alexander J. Varshavsky, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 30, 1981, Ser. No. 279,155
Int. Cl.[3] C12Q 1/68, 1/00
U.S. Cl. 435—6 11 Claims

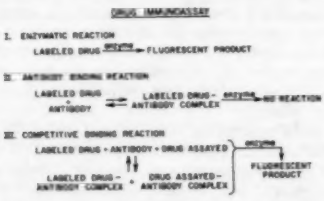
1. A method for indicating the tumor-promoting characteristics of a substance or process, comprising determining the incidence of gene amplification of a cell culture that is induced by said substance or process and using the induction of gene amplification as an indication of the tumor-promoting capability of the substance or process.

4,442,204

HOMOGENEOUS SPECIFIC BINDING ASSAY DEVICE AND PREFORMED COMPLEX METHOD

Alfred C. Greenquist, Elkhart, and Bert Walter, South Bend, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 10, 1981, Ser. No. 253,147
Int. Cl.[3] G01N 33/54, 33/58, 33/52
U.S. Cl. 435—7 13 Claims



1. A test device for detecting the presence of a ligand in a test sample, said test device comprising a carrier matrix incorporated with components for a homogeneous specific binding assay for the ligand, said components comprising a complex of a specific binding partner for the ligand and a conjugate comprising a label and the ligand or a specific binding analog of the ligand, wherein the label is capable of providing a detectable response when not part of said complex, but which response is inhibited when the label-containing conjugate is part of said complex, and wherein said specific binding partner is unbound to said matrix.

4,442,205

SIMIAN VIRUS RECOMBINANT THAT DIRECTS THE SYNTHESIS OF HEPATITIS B SURFACE ANTIGEN

Dean H. Hamer, Washington, D.C., and John Gerin, Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 22, 1981, Ser. No. 304,571
Int. Cl.[3] C12P 21/00; C12N 15/00, 1/00, 7/06
U.S. Cl. 435—68 2 Claims

1. A process for producing hepatitis B surface antigen comprising the steps of:

(a) digesting HBV DNA and an *E. coli* plasmid with Bam HI and ligating the digest to produce *E. coli* plasmid-HBV recombinant

(b) cleaving the resulting plasmid-HBV with Bam HI to produce a 1350 bp DNA fragment containing the HB_sAg coding region

(c) preparing recombinant plasmid-SV40 by ligating a Bam HI Eco RI digest of *E. coli* plasmid and SV40

(d) said 1350 bp DNA fragment is then ligated to Bam HI cleaved plasmid-SV40 to produce double recombinant *E. coli* plasmid-SV40-HBV

(e) said double recombinant plasmid is then cleaved with Hae II to generate 4950 bp linear SV40-HBV recombinant molecules

(f) infecting monkey kidney cells with the 4950 bp molecules and SV40 temperature sensitive early gene mutant helper virus and

(g) culturing the infected cells to produce hepatitis B surface antigen.

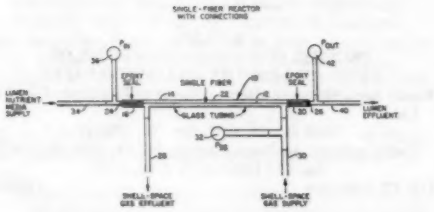
2. The double recombinant plasmid produced by the process of claim 1 wherein the *E. coli* plasmid is pBR322.

4,442,206

METHOD OF USING ISOTROPIC, POROUS-WALL POLYMERIC MEMBRANE, HOLLOW-FIBERS FOR CULTURE OF MICROBES

Alan S. Michaels, New York, N.Y.; Channing R. Robertson, Stanford; Stanley N. Cohen, Portola Valley, both of Calif.; Douglas S. Inloes, Clayton, Mo., and William J. Smith, Stanford, Calif., assignors to Stanford University, Stanford, Calif.

Continuation of Ser. No. 179,590, Aug. 21, 1980, abandoned.
This application May 4, 1983, Ser. No. 489,609
Int. Cl.[3] C12P 21/00; C12N 9/00; C12M 3/00
U.S. Cl. 435—68 11 Claims



1. A method for the efficient cultivation of microbial cells employing a microbiological reactor comprising isotropic, porous-wall polymeric hollow-fibers having a cell free zone and a cell containing zone, said cell containing zone substantially located in the space surrounding said hollow-fiber and partially extending beneath the outer surface of said hollow-fibers, wherein both zones are perfused with nutrient medium and separated by a porous barrier permeable to said nutrient medium and impermeable to said cells,

said method comprising:

continuously introducing at an entry port of said cell free zone at a pressure greater than the pressure of said nutrient medium in said cell containing zone a nutrient medium stream, whereby said nutrient medium flows out of said cell free zone into said cell containing zone and said microbial cells metabolize nutrients in said nutrient medium to products to produce a product-containing spent nutrient medium in said cell containing zone and said cells further proliferating within said cell containing zone to a cell density greater than 10^{12} cell/ml;

continuously flowing said nutrient medium stream remaining in said cell free zone toward an exit port in said cell free zone while reducing the pressure of said nutrient medium stream, so that the pressure of said nutrient medium stream at said exit port is below the pressure of said product-containing nutrient medium in said cell containing zone, whereby product-containing spent nutrient medium in said cell containing zone flows into said cell free zone near said exit port and mixes with said nutrient medium in said cell free zone to form a mixture; and

continuously removing said mixture from said exit port of said cell free zone.

4,442,207

PROCESS FOR PRODUCTION OF GLUCOSONE

Robert O. Horwath, Westport, and Osama O. Ibrahim, Brookfield, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 30, 1982, Ser. No. 393,850
Int. Cl.³ C12P 19/02; C12N 9/04; C12R 1/645
U.S. Cl. 435—105 8 Claims

1. A process for producing glucosone and co-producing hydrogen peroxide which comprises contacting an aqueous solution of glucose with oxygen and glucose-2-oxidase produced by at least one fungus of the Basidiomycetes class selected from the group consisting of NRRL 15093, NRRL 15094 and NRRL 15095, said fungus being characterized in that substantially all of the glucose-2-oxidase activity thereof is available to aqueous glucose substrate on contact therewith without disruption of the fungus.

4,442,208

METHOD FOR PRODUCING L-ISOLEUCINE BY FERMENTATION

Takayasu Tsuchida, Yokohama; Kiyoshi Miwa, Matsudo, and Shigeru Nakamori, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,145
Claims priority, application Japan, Jun. 25, 1981, 56-98699
Int. Cl.³ C12P 13/06; C12N 15/00, 1/20
U.S. Cl. 435—116 5 Claims

1. A method of producing L-isoleucine by fermentation, which comprises:

aerobically culturing in an aqueous culture medium an L-isoleucine producing microorganism selected from the group consisting of *Corynebacterium glutamicum* AJ 11686 and *Brevibacterium lactofermentum* AJ 11687.

4,442,209

PROCESS FOR THE PRODUCTION OF MONASCUS-PIGMENT

Toshio Miyake; Shoichi Ohno, and Shuzo Sakai, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed May 4, 1982, Ser. No. 374,685
Claims priority, application Japan, May 16, 1981, 56-73832
Int. Cl.³ C12P 17/18, 1/02
U.S. Cl. 435—119 6 Claims

1. In the process for the production of Monascus-pigment which comprises cultivating in a nutrient medium a microorganism of genus Monascus capable of producing said pigment, and harvesting the resultant pigment from the culture, the improvement whereby the production of Monascus-pigment is greatly increased, comprising cultivating said microorganism in a nutrient medium containing 0.1–95% maltitol as a carbon source.

4,442,210

PROCESS FOR THE PRODUCTION OF FERMENTATION ETHANOL

Ralph M. Dessau, Edison, and Werner O. Haag, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,665
Int. Cl.³ C12P 7/06
U.S. Cl. 435—161 28 Claims

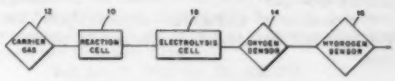
1. In a process for the production of fermentation ethanol, which process comprises fermenting a fermentable carbohydrate thereby forming a fermented mixture comprising a dilute aqueous ethanol solution, the improvement consisting essentially of selectively sorbing ethanol from said fermented mixture with a crystalline zeolite sorbent having a silica to alumina mol ratio of at least 35 and an effective pore diameter of at least 5 Angstroms under conditions effective to sorb from at least about 10% to about 100% of said ethanol contained in said fermented mixture, separating said sorbent from said fermented mixture and desorbing sorbed ethanol from said sorbent.

4,442,211

METHOD FOR PRODUCING HYDROGEN AND OXYGEN BY USE OF ALGAE

Elias Greenbaum, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1982, Ser. No. 388,872
Int. Cl.³ C12P 3/00; C12N 13/00, 1/12; A01H 13/00
U.S. Cl. 435—168 8 Claims



1. A method of producing H_2 and O_2 by use of algae and light comprising the following steps in the sequence set forth:

(1) subjecting algae in an aqueous phase to light in an environment substantially free of CO_2 and atmospheric O_2 to produce H_2 and O_2 by the action of the light-stimulated algae in splitting water molecules during a first period of time of sufficient duration to produce a physiological stress on said algae;

(2) culturing said algae in culture medium in an aerobic atmosphere during a second period of time sufficient to remove said physiological stress; and

(3) subjecting said algae in an aqueous phase to light in an environment substantially free of CO_2 and atmospheric O_2 during a third period of time at an enhanced rate of production of H_2 and O_2 compared to that occurring during said first time period of step (1).

4,442,212

MONOTHIOGLYCEROL AS THIOL-PROTECTOR IN LYOPHILIZED MATERIALS

Anglis R. Briggs, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 10, 1980, Ser. No. 205,793
Int. Cl.³ C12N 9/96
U.S. Cl. 435—188 8 Claims

1. A water reconstitutable lyophilized product of a solution consisting essentially of:

(A) monothioglycerol, present in the pre-lyophilized solution to an extent of not less than 2 mmoles/liter of solution and in an amount not leading to gelation of the solution;

(B) sulfhydryl-requiring enzyme; and

(C) substantially completely delipified animal serum having low residual levels of enzyme activity.

4,442,213

PROCESS FOR THE PREPARATION OF PLASMINOGEN AND PLASMINOGEN THUS PREPARED

Helmut Heber; Horst Schwinn; Norbert Heimburger, all of Marburg; Gerhardt Kumpe, Wetter, and Manfred Schick, Marburg, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed May 12, 1982, Ser. No. 377,312
Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119157
Int. Cl.³ C12N 9/68, 9/96
U.S. Cl. 435—217 7 Claims

1. A process for preparing plasminogen which is virtually free of hepatitis virus, which comprises heating a solution of plasminogen having a plasminogen concentration greater than 20 CTA units per milliliter which contains a proteinase inhibi-

tor with plasmin specificity, an amino acid, and a saccharide or sugar alcohol.

4,442,214
THERMO-STABLE MICRO-ORGANISM

Hugh W. Morgan, and Roy M. Daniel, both of Hamilton, New Zealand, assignors to Development Finance Corporation of New Zealand, Wellington, New Zealand

Filed Aug. 8, 1980, Ser. No. 176,528
Claims priority, application New Zealand, Aug. 8, 1979, 191246
Int. Cl.³ C12N *1/20, 9/50*
U.S. Cl. 435—253 14 Claims

1. A culture of THERMUS AQUATICUS (VARIETY T-351), ATCC No. 31,674, in substantially biologically pure form.

4,442,215
ELEMENT-RICH COMPOSITION

Anders M. Vognsen, Sollerod Slotsvej 17, DK-2840 Holte, and Henrik Boisen, Virum, both of Denmark, assignors to Anders Marius Vognsen, Sollerod, Denmark

PCT No. PCT/DK81/00013, 371 Date Oct. 12, 1981, 102(e) Date Oct. 12, 1981, PCT Pub. No. WO81/02242, PCT Pub. Date Aug. 20, 1981
PCT Filed Feb. 11, 1981, Ser. No. 310,075
Claims priority, application Denmark, Feb. 11, 1980, 589/80
Int. Cl.³ C07G *17/00*
U.S. Cl. 435—262 10 Claims

5. A method for preparing an element-rich composition for use in biological and physiological systems, comprising fermenting lactic acid producing bacteria in an aqueous fermentation medium containing fly ash, converting a plurality of the components of the fly ash into a biologically assimilable form and recovering the converted biologically assimilable mineral containing liquid after the completion of said fermentation.

4,442,216
CONTINUOUS ENZYMATIC REACTOR FOR USE OF IMMOBILIZED ENZYME BEADS

Douglas G. Harvey, deceased, late of Baltimore, Md.; by Dolores C. Harvey, executrix, 220 Ridgewood Rd., Baltimore, Md. 21210, and Christian D. Harvey, 220 Ridgewood Rd., Baltimore, Md. 21210

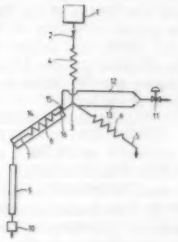
Filed Sep. 29, 1982, Ser. No. 427,879
Int. Cl.³ C12M *1/40*; C12N *11/00, 11/14*
U.S. Cl. 435—288 15 Claims

1. A continuous enzymatic reactor for use of immobilized enzyme beads to act on a fluid reactant material and to produce a product lighter in weight than said immobilized enzyme beads comprising a basic reactor having first and second ends, a screw, a shell, the screw mounted coaxially within the shell; means for introducing cleansed immobilized enzyme beads continuously to the basic reactor at said first end, means for feeding fluid reactant material into the basic reactor at said first end, means for continuously mixing, agitating and transporting said immobilized enzyme beads and fluid reactant material by rotating said screw; means at said second end for removing product produced; a cleansing chamber, means for lifting the immobilized enzyme beads continuously from said second end and dropping them through said cleansing chamber; means for cleansing the immobilized enzyme beads continuously during said dropping, and means for conveying the cleansed immobilized enzyme beads continuously from the cleansing chamber to said means for introducing.

4,442,217
SAMPLE INJECTION

David R. Deans, Nunthorpe, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 172,975, Jul. 28, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 339,981
Claims priority, application United Kingdom, Aug. 6, 1979, 7927347
Int. Cl.³ G01N *31/08*
U.S. Cl. 436—161 6 Claims



1. A method of introducing a sample of controlled quantity so that reproducible sample quantities can be obtained regardless of variations in pressure and/or temperature, said method comprising the steps of:

(a) passing a stream of sample fluid through a restriction to its flow to a junction which leads to at least two outlet limbs of which at least one of said outlet limbs is a sample injection limb and another is a vent limb, each of said outlet limbs comprising a restriction to fluid flow;

(b) passing carrier fluid at a substantially constant pressure to each sample injection limb downstream of said junction and upstream of its restriction to fluid flow, the restrictions to fluid flow of the outlet limbs and the pressures downstream of them being such that the volumetric rate of flow of sample fluid and carrier fluid through the vent limb is greater than the volumetric rate of flow of sample fluid through the inlet limb, the volumetric flow rate of sample fluid through said inlet limb being greater than the flow rate through each sample injection limb, and the volumetric flow rate of carrier fluid being at least equal to the total of the volumetric flow rates through all of the sample injection limbs;

(c) switching the supply of carrier fluid from a sample injection limb to the vent limb at a point downstream of said junction and upstream of its restriction to fluid flow for a controlled time while maintaining the supply of carrier fluid to any other sample injection limb thus injecting a portion of sample fluid to the first mentioned sample injection while the remainder of the sample fluid continues to flow through the vent limb;

(d) switching the supply of carrier fluid switched according to step (c) from the vent limb to the sample injection limb to resume supply of carrier fluid, therethrough; and

(e) controlling the temperature of the sample injection limb.

4,442,218
METHOD OF MEASURING DEGREE OF PARTITIONING

Lynn G. Amos, Painted Post, N.Y., and Charles H. Rogers, Duxbury, Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed May 27, 1981, Ser. No. 267,580
Int. Cl.³ G01N *33/58, 33/60*; G01T *1/00*
U.S. Cl. 436—525 16 Claims

1. A method of measuring the degree of partitioning of a labeled species between free and bound states which comprise the steps of:

A. incubating the labeled species in a liquid medium with an

insoluble porous monolith having a means for binding a portion of the labeled species within the pores thereof, thereby partitioning the labeled species between free and bound states, which monolith is capable of substantially attenuating the signal emitted by the bound labeled species, wherein the liquid medium volume is sufficient to prevent the monolith from substantially attenuating the signal emmitted by the free labeled species and the liquid medium per se does not substantially attenuate the signal emitted by labeled species, whether free or bound; and

B. measuring the composite signal emitted by the labeled species in both the free and bound states in the mixture of liquid medium and insoluble porous monolith, with the measured composite signal being directly related to the degree of partitioning of the labeled species between the free and bound states, wherein the difference between the attenuation of the signal emitted by the free labeled species and the attenuation of the signal emitted by the bound labeled species is at least about 40 percent when the attenuations of the signals emitted by the labeled species in the free and bound states are expressed as percentage values;

wherein the insoluble porous monolith is composed essentially of iron, stainless steel, nickel, lead, or high-lead glass.

4,442,219
TWO PART CASTABLE CERAMIC CEMENT

John D. TenEyck, Lewiston; Russell D. Smith, Grand Island, and Kurt W. Hoff, Tonawanda, all of N.Y., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Oct. 19, 1981, Ser. No. 312,586
Int. Cl.³ C04B *35/02, 35/80*
U.S. Cl. 501—95 **10 Claims**

1. A two part castable ceramic cement wherein the first and second parts are mixed together, prior to use, in proportions of the first part to the second part of from 1:3 to 3:1; said first part being a partially dewatered slurry of about 50 to about 20 weight percent solids in water wherein the slurried solids consist essentially of from about 5 to about 15 weight percent colloidal silica, from about 3 to about 10 weight percent of an organic adhesive, from about 2 to about 10 weight percent of organic fibers, from about 35 to about 60 weight percent ceramic fiber and from about 0.5 to about 30 weight percent of a high temperature inorganic filler; said second part being essentially dry and comprising from about 50 to about 100 weight percent calcium aluminate, the majority of the remainder said second part being a high temperature inorganic filler.

4,442,220
DIELECTRIC CERAMICS

Hiromu Ouchi, Toyonaka; Syunichiro Kawashima, Nishinomiya; Masamitsu Nishida, Osaka, and Ichiro Ueda, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 13, 1982, Ser. No. 367,977
Claims priority, application Japan, Apr. 15, 1981, 56-57375; Apr. 20, 1981, 56-60182
The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.
Int. Cl.³ C04B *35/46, 35/50*
U.S. Cl. 501—139 **3 Claims**

1. A dielectric ceramic composition consisting of barium oxide, titanium oxide, samarium oxide and praseodymium oxide in which the composition formula is represented by

$$xBaO\text{-}yTiO_2\text{-}z\{(Sm_2O_3)_{1-v}(Pr_2O_{11/3})_v\}$$

wherein x, y, z and v in terms of mole fraction fall in the range that $0.05 \leqq x \leqq 0.23$, $0.57 \leqq y \leqq 0.825$, $0.025 \leqq z \leqq 0.375$, $x+y+z=1$, and $0.01 \leqq v \leqq 0.95$.

2. A dielectric ceramic composition consisting of barium oxide, titanium oxide, samarium oxide, praseodymium oxide and neodymium oxide in which the composition formula is represented by

$$xBaO\text{-}yTiO_2\text{-}z\{(Sm_2O_3)_{1-(v+u)}(Pr_2O_{11/3})_v(Nd_2O_3)_u\}$$

wherein x, y, z, v and u in terms of mole fraction fall in the range that $0.05 \leqq x \leqq 0.23$, $0.57 \leqq y \leqq 0.825$, $0.025 \leqq z \leqq 0.375$, $x+y+z=1$, $0.01 \leqq v \leqq 0.65$, $0.01 \leqq u \leqq 0.665$ and $0.02 \leqq (v+u) \leqq 0.95$.

4,442,221
PROCESS FOR REGENERATING A SPENT COPPER COMPOSITE SULFUR SORBENT

Keith C. Bishop, III, San Rafael; David E. Earls, Pinole; Richard C. Robinson, San Rafael, all of Calif.; Donald W. Blakely, deceased, late of Oakland, Calif., and by Robert L. Jacobson, administrator, Vallejo, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 9, 1982, Ser. No. 367,070
Int. Cl.³ B01J *20/34;* **C10G** *29/16, 29/04*
U.S. Cl. 502—25 **7 Claims**

1. A process for regenerating a spent copper inorganic porous carrier composite sorbent for removing sulfur-containing compounds from hydrocarbons comprising:

(a) contacting the spent sorbent with an oxidizing gas at a temperature and for a time sufficient to convert at least a portion of the sulfur in the sorbent to a sulfate form or sulfur dioxide; and

(b) thereafter impregnating the sorbent with fresh copper by

(i) contacting the sorbent with an aqueous solution of a copper salt whereby the copper salt is deposited on the sorbent surface;

(ii) drying the copper salt-treated sorbent to remove solvent;

(iii) calcining the dried sorbent at an elevated temperature that converts the copper salt on the sorbent to copper oxide or copper metal; and

(iv) recovering the regenerated sorbent without having removed a substantial portion of the contaminant sulfur.

2. The process of claim 1 wherein between steps (a) and (b) the oxidized sorbent is contacted with a reducing gas at a temperature and for a time sufficient to further convert the sulfur in the sorbent to sulfur dioxide.

3. The process of claim 2 wherein the oxidizing gas is nitrogen containing about 0.3% to about 3% by volume oxygen and the reducing gas is nitrogen containing about 0.2% to about 4% by volume hydrogen.

4,442,222
ADSORBENT FOR SEPARATION OF PARA-XYLENE

William Smolin, Fishkill, and John H. Estes, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,384
Int. Cl.³ B01J *29/06*
U.S. Cl. 502—60 **8 Claims**

3. Synthetic crystalline barium aluminosilicate zeolite HP having an atom ratio of silicon to aluminum in the unit cell below 1.0 prepared by the process which comprises exchanging a synthetic crystalline sodium aluminosilicate zeolite HP with barium thereby forming product synthetic crystalline barium aluminosilicate zeolite HP; and recovering said product synthetic crystalline barium aluminosilicate zeolite HP.

6. Synthetic crystalline barium/potassium aluminosilicate HP having an atom ratio of silicon to aluminum in the unit cell below 1.0 prepared by the process which comprises exchanging a synthetic crystalline sodium aluminosilicate zeolite HP with barium and potassium thereby forming product synthetic crystalline barium/potassium aluminosilicate zeolite HP; and recovering product synthetic crystalline barium/potassium aluminosilicate zeolite HP.

4,442,223

CATALYST AND CATALYST SUPPORT COMPOSITIONS

Arthur W. Chester, Cherry Hill, and William A. Stover, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 104,522, Dec. 17, 1979, Pat. No. 4,326,993. This application Mar. 22, 1982, Ser. No. 360,122
The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.
Int. Cl.³ B01J 21/16, 29/06
U.S. Cl. 502—68 18 Claims

1. A composition adapted for application as a catalyst or catalyst support which is prepared by blending a mixture of components comprising (1) about 1–99 weight percent of colloidal dispersions of alumina particles, (2) about 1–99 weight percent of colloidal dispersions of silica particles, (3) about 1–75 weight percent of a particulate weighting agent, and (4) about 1–75 weight percent of crystalline aluminosilicate zeolite hydrocarbon conversion component selected from the group consisting of X, Y, erionite, mordenite and faujasite, and thereafter drying the resultant composite; said alumina and silica particles having diameters in the range of 10–10,000 Å and said particles having at least 40 weight percent of the 30–300 Å diameter pore volume in the range between 60–80 Å , and at least 25 percent of total pore volume in excess of 30 Å being in the range of said 60–80 Å.

3. A composition in accordance with claim 1 wherein the weighting agent is a particulate clay selected from the group consisting of attapulgite, bauxite, montmorillonite, kaolin and fuller's earth.

14. A composition adapted for application as a catalyst or catalyst support which is prepared by blending a mixture of components comprising (1) about 20–90 weight percent of colloidal dispersion of alumina particles, and (2) about 10–80 weight percent of colloidal dispersion of silica particles, and thereafter drying the resultant composite; said alumina and silica particles having diameters in the range of 10–10,000 Å and said composite having at least 40 weight percent of the 30–300 Å diameter pore volume in the range between 60–80 Å, and at least 25 percent of total pore volume in excess of 30 Å being in the range of said 60–80 Å.

4,442,224

CATALYTIC COMPONENT FOR POLYMERIZATION OF α-OLEFIN AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Masaru Takitani; Shizuo Tomiyasu, and Keikichi Baba, all of Shinnanyo, Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,586
Claims priority, application Japan, Jun. 11, 1981, 56-89857
Int. Cl.³ C08F 4/64
U.S. Cl. 502—112 2 Claims

1. A catalytic component for polymerizing an α-olefin, prepared by the following steps:

(a) reacting an organo-magnesium compound with a halogenating agent in the presence of an electron donor compound at a temperature between −50° C. and 100° C. to obtain a solid product; the organo-magnesium compound being expressed by the formula R'MgX', wherein R' is a hydrocarbon group having 1 to 20 carbon atoms, and X' is a halogen atom selected from the group consisting of chlorine, bromine and iodine or a hydrocarbon group having 1 to 20 carbon atoms;

(b) treating the solid product with at least one of an alcohol and a phenol for at least 0.1 hour at a temperature above the melting point of the at least one of an alcohol and a phenol;

(c) treating the resulting product from step (b) with at least 0.01 mol of a halogen-containing titanium compound, per mol of magnesium in the resulting product from step (b), at a temperature between room temperature and 150° C.; and

(d) treating the resulting product from step (c) with a mixture or complex consisting of an organo-aluminum compound, a carboxylic acid ester and a polysiloxane, at a temperature between 0° C. and 100° C.

4,442,225

CATALYTIC COMPONENT FOR POLYMERIZATION OF α-OLEFIN AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Masaru Takitani; Shizuo Tomiyasu, and Keikichi Baba, all of Shinnanyo, Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,587
Claims priority, application Japan, Jun. 11, 1981, 56-89858
Int. Cl.³ C08F 4/64
U.S. Cl. 502—112 5 Claims

1. A catalytic component for polymerization of an α-olefin prepared by the following steps:

(a) reacting an organo-magnesium compound, or a mixture or reaction product of the organo-magnesium compound and an organo-aluminum compound, with a mixture or reaction product of a halogenating agent other than a halogenated titanium compound and a titanium compound at a temperature between −50° C. and 100° C. in the presence of an electron doner compound and an α-olefin, to obtain a solid product; the halogenating agent being used in an amount of 0.01 to 10 mol and the titanium compound being used in an amount of 0.001 to 0.4 mol, each per mol of the hydrocarbon group of the organo-magnesium compound, or the mixture or reaction product of the organo-magnesium compound and the organo-aluminum compound; and

(b) treating the solid product with at least one of an alcohol and a phenol in an amount of 0.01 to 10 mol per mol of magnesium existing in the solid product, for at least 0.1 hour at a temperature above the melting point of the at least one of an alcohol and a phenol.

4,442,226

CATALYST FOR VAPOR PHASE OXIDATION OF N-BUTANE TO MALEIC ANHYDRIDE

Tom A. Bither, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 349,305, Feb. 16, 1982, Pat. No. 4,371,702.
This application Sep. 22, 1982, Ser. No. 421,467
Int. Cl.³ B01J 27/14
U.S. Cl. 502—209 12 Claims

1. Improved vanadium/phosphorus oxide catalyst for the oxidation of n-butane to maleic anhydride, said improved catalyst containing the promoter comprising silicon and at least one of indium, antimony and tantalum, the Si/V atom ratio being in the range 0.02–3.0:1.0, the (In+Sb+Ta)/V atom ratio being in the range 0.005–0.2:1.0 and the P/V atom ratio being in the range 0.9–1.3:1.0, said catalyst being prepared in an aqueous or organic liquid medium by the procedure wherein the appropriate vanadium species substantially of valence +4 is contacted with the promoter or promoter precursors and thereafter with the appropriate phosphorus species.

4,442,227

SUBSTITUTED COBALT OXIDE SPINELS FOR CATALYTIC DECOMPOSITION OF HYPOCHLORITE

Donald L. Caldwell, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 334,791, Dec. 28, 1981. This application Oct. 18, 1982, Ser. No. 435,018

Int. Cl.³ B01J 23/78, 23/80

U.S. Cl. 502—243 13 Claims

1. A hypochlorite-decomposition catalyst composition, said composition consisting essentially of

pellets or particles of ceramic or refractory material having applied as a coating thereon,

a substituted cobalt spinel conforming generally to the empirical structure

$$M_xN_yCo_{3-(x+y)}O_4$$

where $zero < x \leqq 1$; $zero \leqq y \leqq 0.5$; $zero < (x+2y) \leqq 1$; M is at least one metal of Periodic Table Groups IIA, and IIB; and N is at least one metal from Group IA.

4,442,228

PROCESS FOR THE MANUFACTURE OF ETHANOL FROM SYNTHESIS GAS

Ernst I. Leupold, Neu-Anspach; Hans-Joachim Schmidt, Königstein; Friedrich Wunder, Flörsheim am Main; Hans-Jürgen Arpe, Kelkheim, and Horst Hachenberg, Walluf, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 289,706, Aug. 3, 1981, abandoned, which is a continuation of Ser. No. 86,952, Oct. 22, 1979, abandoned. This application Nov. 19, 1982, Ser. No. 443,131

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 2846148

Int. Cl.³ C07C 27/06, 31/08

U.S. Cl. 518—714 7 Claims

1. In a catalytic process for the manufacture of ethanol by catalytically reacting carbon monoxide and hydrogen in the presence of a supported rhodium catalyst at a temperature in the range of 175° C. to 375° C. and a pressure in the range of 1 to 300 bar, the improvement which comprises selecting a supported rhodium catalyst consisting of an rhodium component and at least one co-catalyst selected from the group consisting of zirconium, hafnium, lanthanum, platinum, chromium and mercury wherein said rhodium component and co-catalyst are applied by impregnation onto a catalyst carrier of silicic acid or silicates of elements of groups II to VIII of the Periodic Table.

4,442,229

REGENERATION OF ION EXCHANGE MATERIALS

James R. Emmett, Brewood, England, assignor to Northern Engineering Industries plc, England

Filed Feb. 22, 1983, Ser. No. 468,196

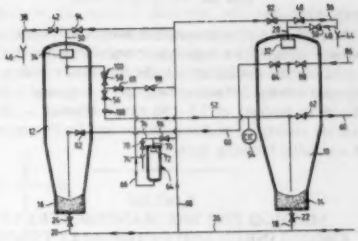
Claims priority, application United Kingdom, Mar. 30, 1982, 8209291

The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.

Int. Cl.³ B01J 49/00

U.S. Cl. 521—26 1 Claim

1. A method of regenerating particulate anion and cation ion exchange materials comprises classifying the materials above a perforate barrier in a separator vessel into an upper anion material layer, an intermediate interfacial region and a lower cation material layer by passing water upwardly within the vessel, transferring cation material from the vessel through a conduit having an inlet adjacent the barrier and an outlet outside the vessel by passing water into the vessel and allowing flow through the conduit until a major proportion of cation material has passed through said outlet of the conduit, major proportion of material from the interfacial region has entered the conduit and a major proportion of anion material remains in said separator vessel, detecting an interface in the conduit between materials, isolating said outlet from said inlet in response to detection of said interface, regenerating at least said major proportions of cation and anion materials, reclassifying the regenerated anion material by passing water upwardly



therethrough to allow contaminant cation material present in the anion material to settle to the bottom of the anion material, removing material from the bottom of the anion material to remove settled contaminant cation material, said removed material being isolated from the regenerated materials and remixing the regenerated materials.

4,442,230

Patent Not Issued For This Number

4,442,231

AMINOPHOSPHONIC ACID CHELATE RESIN

Yushin Kataoka; Masaaki Matsuda, and Masaru Kamoda, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 16, 1982, Ser. No. 369,088

Claims priority, application Japan, Apr. 23, 1981, 56-62198

Int. Cl.³ B01J 39/20; C08F 8/40, 8/30

U.S. Cl. 521—32 4 Claims

1. A process for producing a chelate resin which comprises reacting an amino resin having amine-reactive groups (A) with an amino compound having one or more primary and/or secondary amino groups (B) to produce an aminated resin, and subsequently reacting the animated resin with an alkylphosphonation agent (C), the amino compound being used in an amount of 1/20 mole or more per equivalent weight of the amine-reactive group in the resin (A), the alkylphosphonation agent being used in an amount of 1/10 mole or more per equivalent weight of amino group in the aminated resin.

4,442,232

EXPANDABLE STYRENE-MALEIC ANHYDRIDE COPOLYMER PARTICLES AND A PROCESS FOR MOLDING THE SAME

Mutsuhiko Kajimura, Moriyama, and Tetsuji Maeda, Nara, both of Japan, assignors to Sekisui Plastic Co., Ltd., Tokyo, Japan

Division of Ser. No. 146,012, May 2, 1980, Pat. No. 4,278,627. This application Nov. 12, 1980, Ser. No. 206,080

Claims priority, application Japan, May 7, 1979, 54-56047

Int. Cl.³ C08J *9/18, 9/20*

U.S. Cl. 521—56 **9 Claims**

1. An expandable styrene-maleic anhydride copolymer particle which comprises a copolymer resin obtained by the reaction of a styrene-maleic anhydride copolymer with a hydroxy compound having 2–4 active hydroxy groups and 2–15 carbon atoms in an amount of 2.5–150 mol% relative to the maleic anhydride moiety of said copolymer and further impregnated with a volatile blowing agent.

4,442,233

METHOD FOR THE MANUFACTURE OF CROSS-LINKED AND OPTIONALLY FOAMED POLYPROPYLENE

Ernst Lohmar, Weinheim, and Wolffried Wenneis, Mannheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Continuation of Ser. No. 77,909, Sep. 24, 1979, abandoned. This application Jun. 17, 1982, Ser. No. 389,559

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1978, 2939733

Int. Cl.³ C08J *9/04*

U.S. Cl. 521—98 **19 Claims**

1. In a method for producing cross-linked crystalline high pressure or low pressure polypropylene by subjecting said polypropylene to high energy radiation and/or heating a mixture of said polypropylene with a peroxide cross-linking agent, the improvement comprising mixing said polypropylene with from about 2 to about 20 weight percent, based upon the weight of said polypropylene of, a normally liquid polybutadiene, and a foaming agent compounding said mixture at a temperature of about 160° C. to about 180° C.; and thereafter subjecting said compounded mixture to conditions sufficient to cross-link said polypropylene and foam said mixture.

4,442,234

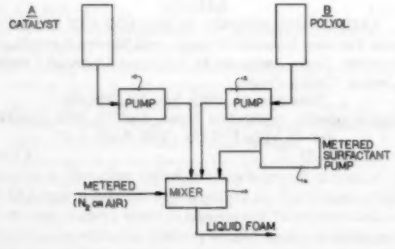
NYLON FOAM

Bruce G. Kosa, Woodstock, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Jul. 25, 1983, Ser. No. 516,779

Int. Cl.³ C08J *9/30*

U.S. Cl. 521—112 **4 Claims**



1. A process for preparing a nylon block copolymer foam comprising:

(a) mixing a catalyzed reactant stream comprising a bromide catalyst dissolved in molten caprolactam with a second molten caprolactam stream containing a polyol prepolymer prepared by reacting a polyol with bis acyllactam in an intensive mixer;

(b) adding a silicone-based surfactant and a frothing agent to said mixture so as to froth the mixture;

(c) injecting said frothed mixture into a preheated mold, and

(d) curing said frothed mixture in said mold to form said foam.

4,442,235

PROCESS AND COMPOSITION FOR THE PRODUCTION OF POLYURETHANE ELASTOMER MOLDINGS

Ronald P. Taylor, Coraopolis; John E. Dewhurst, Oakdale, and Saad M. Abouzahr, Coraopolis, all of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 9, 1983, Ser. No. 492,923

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—122 **14 Claims**

1. In a process for the production of polyurethane elastomer moldings by reacting a reaction mixture in a closed mold, the improvement wherein said reaction mixture comprises:

(a) an organic polyisocyanate;

(b) an organic active hydrogen group-containing compound having a molecular weight of from 1800 to 12,000 and containing at least two active hydrogen groups,

(c) 1,3,5-triethyl-2-6-diamino benzene and, optionally

(d) a catalyst for the reaction between hydroxyl groups and isocyanate groups,

wherein component (c) is present in an amount of from 25 to 35 percent by weight based on the combined weight of components (b) and (c), wherein the amounts of components (a), (b) and (c) are such that the isocyanate index of the reaction mixture is from about 90 to 110, and wherein all of said components are processed via a one-shot process whereby (a) is mixed simultaneously either with (b), (c) and (d) or with a non-reacted premixture of some or all of (b), (c) and (d).

4,442,236

PROCESS FOR THE PRODUCTION OF MOLDED ARTICLES

Werner Rasshofer, Cologne; Hermann Schäfer, Leverkusen; Reiner Paul, Muelheim-Ruhr, and Josef Beuth, Frechen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,276

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 3231399

Int. Cl.³ C08G *18/14, 18/62, 18/79, 18/22*

U.S. Cl. 521—130 **13 Claims**

1. A process for the production of molded articles based on polyurethanes and/or polyureas, having a smooth surface, by the reaction inside a closed mold, of a reaction mixture comprising:

(i) at least one organic polyisocyanate compound, and

(ii) at least one compound having a molecular weight of from 400 to 12,000 which contains at least two isocyanate-reactive groups,

(iii) at least one isocyanate-inert polymer or copolymer of at least one olefinically-unsaturated monomer, which polymer or copolymer has a molecular weight in the range of from 200 to 50,000, determined by vapor pressure osmometry, and is liquid at room temperature and soluble in the reaction mixture, used in a quantity of from 0.01 to 1% by weight, based on component (ii), and

(iv) at least one metal salt of a monocarboxylic acid having at least 8 carbon atoms, used in a quantity of from 0.01 to 2% by weight, based on component (ii).

4,442,237

NOVEL AROMATIC AMIDE POLYOLS FROM THE REACTION OF PHTHALIC ACID RESIDUES, ALKYLENE GLYCOLS AND AMINO ALCOHOLS

Robert L. Zimmerman, Austin, and Kenneth G. McDaniel, Round Rock, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,726
Int. Cl.³ C08G 18/14
U.S. Cl. 521—131 18 Claims

1. A mixture of aromatic polyols having amine and ester functionalities for use in preparing rigid foams, being produced by the process comprising reacting a residue selected from the group consisting of a dimethyl terephthalate manufacturing residue and a polyethylene terephthalate manufacturing residue, with an alkylene glycol and a tertiary amino alcohol.

4,442,238

AROMATIC AMIDE POLYOLS FOR RIGID POLYURETHANE FOAMS

Robert L. Zimmerman, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,822
Int. Cl.³ C08J 11/04; C08G 18/14, 63/02, 63/18
U.S. Cl. 521—164 32 Claims

1. An aromatic polyol having amide and ester functionalities for use in preparing rigid foams, being produced by the process comprising

a. reacting a phthalic acid residue containing ester functionalities with an amino alcohol to form a mixture containing amides and esters, and

b. subsequently reacting the amide and ester mixture with an alkylene oxide to give an aromatic polyol having amide and ester functionalities.

4,442,239

PHOSPHATE DERIVATIVES, PROCESS FOR PRODUCING PHOSPHATE DERIVATIVES AND FILLERS FOR HUMAN HARD TISSUES CONTAINING THE SAME

Masayoshi Tsunekawa; Shinzo Yoshida, and Tamotsu Komura, all of Kawanishi, Japan, assignors to Sankin Industry Co., Ltd., Osaka, Japan

Filed Feb. 10, 1982, Ser. No. 347,429
Claims priority, application Japan, Feb. 12, 1981, 56-19520
Int. Cl.³ C08F 136/14, 136/22, 230/02; A61K 5/00
U.S. Cl. 523—116 19 Claims

1. A phosphate derivative represented by the formula (I)

(I)

wherein A represents an aryl group which may be substituted with one or more substituents selected from the group consisting of an alkenyl group, an acryloyloxy group, a methacryloyloxy, an aryl group, a halogen atom, an alkyl group, an alkoxy group, a hydroxy group substituted with an aryl group and a group of the formula

in which each of said substituents may further be substituted with one or more aryl groups or halogen atoms, and any aryl group as a substituent of the group A may be substituted with a substituent selected from the group consisting of an alkenyl group, an acryloyloxy group, a methacryloyloxy group and a group of the formula

and R's may be the same or different and each represents an alkenyl group, an alkenylaryl group, an acryloyloxy(lower)alkyl group, an acryloyloxyaryl group, a methacryloyloxy(lower)alkyl group or a methacryloyloxyaryl group in which the (lower)alkyl group and aryl group may be substituted with a halogen atom, there being two

groups in the phosphate derivative, including that present in formula (I).

4,442,240

DENTAL FILLING MATERIALS

Byoung I. Suh, Glen Ellyn, Ill., assignor to Bisco, Inc., Lombard, Ill.

Filed Jul. 14, 1983, Ser. No. 513,694
Int. Cl.³ C08K 3/36
U.S. Cl. 523—116 4 Claims

1. A finely divided inorganic filler for use in preparing direct dental filling materials, said filler comprising organo-silane keying agent treated fumed silica having a surface coating comprising about 2-20%, based on the weight of the silica, of an active polyfunctional polymerizable monomer having at least two acrylic end groups.

4,442,241

SHEAR THICKENING COMPOSITION

Evelyn N. Drake, Plainfield, and Peter Calcavecchio, Lodi, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 28, 1982, Ser. No. 392,632
Int. Cl.³ C08L 3/34, 5/01; C09K 7/00
U.S. Cl. 523—130 40 Claims

1. A composition of matter comprising a water-in-oil emulsion having particles of hydratable, water-expandable clay dispersed in the continuous oily phase thereof and wherein both a surfactant and an oil soluble amine are dissolved in said oil phase said composition having a greater low shear thickening time than the same composition free of the oil soluble amine dissolved in the oily phase.

4,442,242

PROCESS AND COMPOSITION FOR INSULATION OF SURFACES, AND PRODUCT THEREBY OBTAINED

Ernst R. Fogelberg, Vällingby, Sweden, assignor to A.B. Bonnierföretagen, Stockholm, Sweden

Continuation of Ser. No. 957,660, Nov. 3, 1978, abandoned, which is a division of Ser. No. 800,200, May 25, 1977, abandoned, which is a continuation of Ser. No. 593,661, Jul. 7, 1975, abandoned. This application Mar. 23, 1981, Ser. No. 246,446

Claims priority, application Sweden, Jul. 10, 1974, 7409097

Int. Cl.[3] **C08K** *7/20, 9/04;* **C08L** *33/08, 91/00*

U.S. Cl. 523—200 **4 Claims**

1. A sprayable composition for coating an uninsulated surface with a water-absorbent coating for the purpose of preventing or reducing occurrence of condensation on the surface, which comprises a liquid blend which consists of a film-forming binder dispersed in an aqueous vehicle wherein said film-forming binder does not swell in said aqueous vehicle having distributed therein granules of heat-expanded perlite; in which said composition has a consistency such that it can be sprayed on said uninsulated surface; in which the water-absorptivity of said heat-expanded perlite is not occluded; and in which said coating composition is capable of setting-up into an adherent, water-absorptive, insulating coating without application of heat, said granules being present in the range of 5–20 percent by weight based on the composition before application, having a grain size of about 0.01 mm to about 1.5 mm, and having been pretreated with 0.2–2 percent by weight based on the composition of a wetting agent.

4,442,243

REINFORCED RESIN COMPOSITES

Raymond T. Woodhams, 33 Palisades, Toronto, Ontario, M6S 2W9, Canada

Filed Jun. 16, 1982, Ser. No. 388,996

Int. Cl.[3] **C08K** *3/34*

U.S. Cl. 523—212 **20 Claims**

1. A reinforced thermoplastic resin composite comprising a thermoplastic high molecular weight polymeric matrix material reinforced with inorganic filler material, said filler comprising from about 20 to about 80 volume percent of the total composite, said composite also containing from about 1 to about 10 weight percent, based upon the weight of inorganic filler, of derivatized propylene polymer wax of number average molecular weight from about 500 to about 10,000, said derivatized propylene polymer wax having functional reactive end groups.

4,442,244

PROCESS FOR PREPARING HEAT-CURABLE, WATER-DILUTABLE COATING COMPOSITIONS FOR COATING METAL SUBSTRATES

Gerhard Johannes, Taunusstein; Fali Shroff, Wiesbaden; Gerhard Dullis, Taunusstein, and Dieter Steidl, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 23, 1981, Ser. No. 276,702

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024158

Int. Cl.[3] **C08L** *0/00*

U.S. Cl. 523—221 **12 Claims**

1. A process for preparing heat-curable, water-dilutable coating compositions based on polymers, cross-linking agents and optionally conventional adjuvants, wherein

(A) 5–35% by weight of at least one epoxy resin which is free from cationic groups, solid at ambient temperature and is liquid at the cross-linking temperature,

(B) 2–20% by weight of at least one hydrophobic resin which is solid at ambient temperature and selected from the group consisting of ketone resin and hydrocarbon resin which is a dicyclopentadiene resin or a hydrocarbon resin derived from the C_5- or C_9-fractions of the petroleum fractionation,

(C) 15–60% by weight of at least one cationic thermosetting synthetic resin having functional groups, which is in the form of a solution or dispersion with a solids content of 10 to 50% by weight,

(D) 5–30% by weight of at least one nitrogen-containing organic crosslinking agent which is solid at ambient temperature and

(E) 0–73% by weight of at least one component selected from the group consisting of pigments and other conventional adjuvants,

in which the sum of components (A) to (E) is always 100% by weight, are processed together, in one or more stages in a grinding apparatus, at least one stage being a wet grinding operation, the original particle size being reduced so far to form a homogeneous coating composition having a particle size of less than 100 μm and subsequently water is added to adjust the solids content to that required for application.

8. A coating composition prepared according to the process as claimed in claim 1 for the electrolytic coating of a metal substrate in an aqueous bath.

4,442,245

EMULSION BASED ON EPOXY RESINS AND DIAMMONIUM SALTS AND ITS PREPARATION

Jörn-Volker Weiss, Haltern; Heinz Riemer, Bottrop, and Friedhelm Mutzberg, Muelheim, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 504,928

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222531

Int. Cl.[3] **C08L** *63/00;* **C08K** *5/16;* **C08J** *3/06;* **C04B** *7/35*

U.S. Cl. 523—401 **15 Claims**

1. An epoxy resin-diammonium salt emulsion, comprising

(a) a liquid epoxy resin;

(b) about 30–130 wt. % of water based on the amount of epoxy resin;

(c) an emulsifying effective amount of an emulsifier comprising a primary, aliphatic alcohol of 8–14 carbon atoms, an adduct thereof with up to 10 ethylene oxide groups, or a mixture thereof; and

(d) an effective amount of a latent curing agent comprising a reaction product of the essentially complete neutralization of a diamine of the formulae

$$H_2N—CH_2—R—NH_2$$

or

$$H_2N—R—CH_2—R—NH_2$$

with oxalic acid,

wherein R is alkyl substituted alkylene or cycloalkylene each of 6–9 carbon atoms in total, or phenylalkylene of 7–9 carbon atoms in total.

4,442,246

AQUEOUS COATING COMPOSITION COMPRISING SELF-EMULSIFIABLE ESTER OF EPOXY AND ACID CONTAINING ADDITION POLYMER

George L. Brown, Scotch Plains, and Arthur T. Spencer, New Providence, both of N.J., assignors to SCM Corporation, New York, N.Y.

Continuation of Ser. No. 95,682, Nov. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 914,472, Jun. 12, 1978, abandoned. This application Apr. 1, 1981, Ser. No. 249,795

Int. Cl.[3] **C08L** *33/02, 63/10*

U.S. Cl. 523—404 **5 Claims**

1. A composition suitable for sanitary can coatings consisting essentially of a self-emulsified mixture substantially free of

oxirane groups including a hydroxy ester copolymer containing carboxyl groups at least some of which, sufficient to achieve self-emulsification in water, are neutralized by volatile amine; which composition is the product of the reaction of:

(A) an acidic addition copolymer having an acid number greater than 150 comprising a copolymer of monoethylenically unsaturated monomers selected from the group consisting of styrene, vinyl toluene, acrylic acid esters, methacrylic acid esters, acrylic acid and methacrylic acid containing at least about 30% by weight of acrylic or methacrylic acid based on the total weight of monomers;

(B) a mixture containing (bisphenol-A)-epichlorohydrin polyether epoxy resin including at least 5% by weight of polyether epoxy resin containing oxirane groups and at least 25% by weight of said (bisphenol-A) polyether being terminated with bisphenol-A and devoid of oxirane groups, said mixture comprising at least 40% of the total resin solids and containing sufficient oxirane groups to provide a ratio of oxirane groups to carboxyl of 1:2 to 1:20; and

conducted in the presence of a tertiary amine in amounts from 0.1% to 0.3% by weight of reactants subjected to esterification.

4,442,247

AQUEOUS COATING COMPOSITIONS

Shinichi Ishikura, Kyoto; Kazunori Kanda, Yao, and Shohachiro Yamaguchi, Neyagawa, all of Japan, assignors to Nippon Paint Company, Ltd., Osaka, Japan

Filed Aug. 25, 1982, Ser. No. 411,482
Claims priority, application Japan, Sep. 2, 1981, 56-138859
Int. Cl.[3] C08L *63/00*; C09D *3/58, 3/66, 3/76*
U.S. Cl. 523—414 **8 Claims**

1. An aqueous coating composition comprising from 45 to 98 parts by weight (solids) of aqueous resin(s) and from 2 to 55 parts by weight (solids) of finely divided water-insoluble resin(s), in which at least a part of said aqueous resin is selected from the cationic resins having amino group(s), the amino-nitrogen equivalent weight being 40 to 2000, and fulfilling the requirement that the water tolerance is greater than 4 and the surface tension for a 1% w/w aqueous solution is less than 51 dyne/cm.

4,442,248

AQUEOUS COATING COMPOSITIONS

Kazunori Kanda, Yao, and Shinichi Ishikura, Kyoto, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Sep. 3, 1982, Ser. No. 414,823
Claims priority, application Japan, Oct. 5, 1981, 56-158929
Int. Cl.[3] C08L *63/00*; C09D *3/58, 3/66, 3/76*
U.S. Cl. 523—414 **8 Claims**

1. An aqueous coating composition comprising from 45 to 98 parts by weight as solids of at least one aqueous resin and from 2 to 55 parts by weight as solids of at least one finely divided water-insoluble resin, in which at least a part of said aqueous resin is selected from amphoteric resins having 0.2 to 4 m mol/g carboxyl groups and 0.01 to 3 m mol/g amino groups.

4,442,249

PARTIALLY ORIENTED POLYESTER YARN FINISH

Gerard D. Lees, and Barry D. Causby, both of Charlotte, N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 433,330, Oct. 7, 1982, abandoned. This application Dec. 13, 1982, Ser. No. 449,068
Int. Cl.[3] B01F *17/42*; D06M *13/18, 13/20*
U.S. Cl. 523—455 **21 Claims**

1. A finish for partially oriented polyester yarn, said finish being an emulsifiable mixture consisting essentially of;

(a) from about 50 to about 90 weight percent of one or more ethylene oxide/propylene oxide copolymers having a molecular weight in excess of about 1000 and having an ethylene oxide content such that the ethylene oxide in the copolymer constitutes less than about 25 weight percent of the finish;

(b) from about 10 to about 35 weight percent of one or more alkyl chain based lubricants, a major amount of which has a smoke point within the range of from about 155° C. to about 200° C.; and

(c) a base neutralized fatty acid in an amount in the range of from about 3 to about 10 weight percent, and sufficient to emulsify the ethylene oxide/propylene oxide copolymer and the alkyl chain based lubricant.

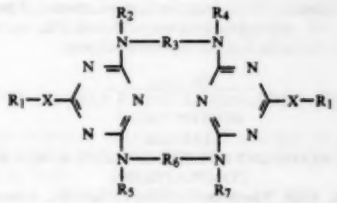
4,442,250

PIPERIDYL DERIVATIVES OF MACROCYCLIC TRIAZINE COMPOUNDS, POSSESSING A STABILIZING ACTIVITY FOR POLYMERS, AND PROCESSES FOR THEIR PREPARATION

Giuseppe Cantatore, Casalecchio di Reno, Italy, assignor to Chimosa Chimica Organica S.p.A., Pontecchio Marconi, Italy

Filed Sep. 28, 1982, Ser. No. 426,153
Claims priority, application Italy, Oct. 2, 1981, 24296 A/81
Int. Cl.[3] C07D *401/14*; C08K *5/34*
U.S. Cl. 524—98 **18 Claims**

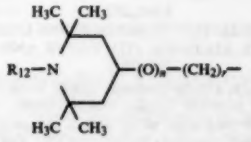
1. A compound of the formula (I)



(I)

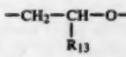
in which R_1 is hydrogen, C_1–C_{18}-alkyl, C_3–C_{18}-alkenyl, C_5–C_{18}-cycloalkyl, substituted or unsubstituted C_6–C_{18}-aryl, substituted or unsubstituted C_7–C_{18}-aralkyl, an —R_8—Y radical, in which R_8 is C_2–C_6-alkylene and Y is —O—R_9 or

R_9 being hydrogen or C_1–C_{18}-alkyl and R_{10} and R_{11}, which may be identical or different, being C_1–C_6-alkyl, 2,2,6,6-tetramethyl-piperid-4-yl or 1,2,2,6,6-pentamethyl-piperid-4-yl, or R_1 is a radical of the formula (II)

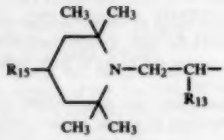


(II)

in which n is zero or 1, r is zero, 1, 2 or 3, R_{12} is hydrogen, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or -alkynyl, substituted or unsubstituted C_7–C_{12}-aralkyl, C_1–C_{12}-acyl, 2,3-epoxypropyl or



in which R_{13} is hydrogen, methyl, ethyl or phenyl and R_{14} is hydrogen, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl, C_7–C_{12}-aralkyl or C_1–C_{12}-acyl, or R_1 is a radical of the formula (III)



(III)

in which R_{15} is hydrogen, C_1–C_8-alkoxy, C_3–C_8-alkenyloxy or benzyloxy and R_{13} is as defined above, and X is >O, >S or >N-R_{16}, in which R_{16} has the same meaning as R_1, and the radical R_1—X—, considered as a whole, can also be chlorine or pyrrolidin-1-yl, piperid-1-yl or hexahydroazepin-1-yl, R_2, R_4, R_5 and R_7, which may be identical or different, are hydrogen, C_1–C_{12}-alkyl, C_2–C_6-hydroxyalkyl, C_3–C_{12}-alkenyl, C_5–C_{12}-cycloalkyl, substituted or unsubstituted C_6–C_{12}-aryl, substituted or unsubstituted C_7–C_{12}-aralkyl or a radical of the formula (II), and R_3 and R_6, which may be identical or different, are C_2–C_{12}-alkylene, C_4–C_{12}-iminodialkylene or -oxadialkylene, C_5–C_{12}-cycloalkylene, C_6–C_{12}-arylene or C_7–C_{12}-aralkylene, and at least one of the radicals R_1, R_2, R_4, R_5 and R_7 in formula (I) is a radical of the formula (II).

15. A light-stabilised, heat-stabilised and oxidation-stabilised polymer composition comprising a synthetic polymer and one or more stabilisers of the formula (I) in an amount of between 0.01 and 5%, preferably between 0.05 and 1%, by weight relative to the weight of the synthetic polymer.

4,442,251

IMPACT RESISTANT POLYPHENYLENE ETHER RESIN COMPOSITIONS

William R. Haaf, Voorheesville; Gim F. Lee, Jr., Albany, and Sei P. Ting, Delmar, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Mar. 4, 1982, Ser. No. 354,894

Int. Cl.³ C08K *5/52;* **C08L** *71/04*

U.S. Cl. 524—141 **8 Claims**

1. A thermoplastic composition, comprising an admixture of:

(a) a blend of a polyphenylene ether resin and a rubber modified high impact polystyrene; and

(b) an impact strength enhancing amount of a copolymer of ethylene and methyl acrylate.

7. A composition according to claim **1**, which includes a flame retardant amount of a flame retardant agent.

4,442,252

COLD-SET ADHESIVE COMPOSITIONS COMPRISING POLYVINYL ALCOHOL FOR PAPER AND PAPER BOARD

Masao Sumi, Nara; Junichi Suenaga, Osaka; Masazo Takenaka, Hyogo; Itaru Murano, Osaka; Mikio Tanabe, and Kiyoshi Hirai, both of Okayama, all of Japan, assignors to Unitika Ltd., Hyogo and Okayama Paper Mill Co., Ltd., Okayama, both of, Japan

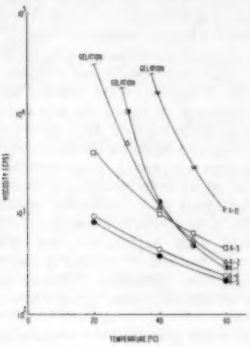
Continuation of Ser. No. 206,605, Nov. 13, 1980, abandoned. This application Apr. 8, 1982, Ser. No. 366,619

Claims priority, application Japan, Nov. 13, 1979, 54-146820

Int. Cl.³ C08K *3/38*

U.S. Cl. 524—183 **13 Claims**

1. A cold-set adhesive for paper having a viscosity of from about 100 to 2,000 centipoises at 60° C. and which gelatinizes upon cooling at a temperature higher than 20° C. and consisting essentially of polyvinyl alcohol, a filler which exhibits alkalinity in an aqueous dispersion, a water-soluble boron compound, and water, the mixing ratio by weight of polyvinyl alcohol to filler being from about 20/80 to 70/30 and the amount of the water-soluble boron compound being from



about 0.2 to 4 parts by weight per 100 parts by weight of polyvinyl alcohol plus filler.

4,442,253

BLEND COMPOUNDS OF SULFONATED POLYMERS AND COMPOSITIONS THEREOF

Robert D. Lundberg, Bridgewater; Warren A. Thaler, Aberdeen, and Pawan K. Agarwal, Westfield, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

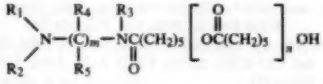
Division of Ser. No. 332,860, Dec. 21, 1981. This application Sep. 29, 1982, Ser. No. 426,661

Int. Cl.³ C08K *5/09, 5/21;* **C08L** *51/08, 53/00*

U.S. Cl. 524—211 **5 Claims**

1. A blend composition which comprises a blend of:

(a) a sulfonated polymer derived from elastomeric or thermoplastic polymers selected from the group consisting of butyl rubbers, EPDM terpolymers, partially hydrogenated polybutadienes, neoprene, styrene-butadiene copolymers and isoprene-styrene random copolymer, which has about 200 meg. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonated groups being neutralized with a polycaprolactone polymer having formula:



wherein n is 1 to 500; M is 1 to 20; R_1 or R_2 are selected from the group consisting of alkyl and cycloalkyl having about 1 to about 20 carbon atoms and aryl groups; R_3 is selected from the group consisting of hydrogen, alkyl and cycloalkyl groups having about 1 to about 20 carbon atoms, and aryl groups; a R_4 and R_5 are selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl groups and wherein the polycaprolactone polymer has a number average molecular weight of about 200 to about 50,000 and a melting point from below 20° C. to 52° C.; and

(b) an unsulfonated thermoplastic or elastomeric polymer; and

(c) at least about 3 parts to less than about 60 parts by weight of a perferential plasticizer per 100 parts by weight of the sulfonated polymer, wherein said perferential plasticizer is selected from the group consisting of carboxylic acids having at least 8 carbon atoms, metallic salts of said carboxylic acids, urea thioureas, amides, amines, ammonium salts of said carboxylic acids, a combination of a carboxylic acid and a metal salt of said carboxylic acid, wherein

a metal ion of said metallic salt is selected from the group consisting of aluminum, antimony, ion, lead and Groups I-A, IIA, I-B and II-B of the Periodic Table of Elements, and mixtures thereof.

4,442,254

POLYAMIDE RESIN COMPOSITION

Yutaka Aratani, Suwa, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 29, 1983, Ser. No. 490,203
Claims priority, application Japan, May 17, 1982, 57-83456
Int. Cl.³ C08K *3/10, 3/04*
U.S. Cl. 524—413 **5 Claims**

1. A polyamide resin composition comprising 20 to 90% by weight of a polyamide resin formed by the reaction of a xylylenediamine and an aliphatic straight-chain dicarboxylic acid having 6 to 12 carbon atoms, 5 to 60% by weight of carbon fiber, and 5 to 60% by weight of potassium titanate fiber.

4,442,255

SELF-EXTINGUISHING POLYOLEFINIC COMPOSITIONS

Franco Marciandi, Rho, and Pasquale Relvini, Bollate, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Aug. 23, 1982, Ser. No. 410,704
Claims priority, application Italy, , 23645 A/81
Int. Cl.³ C08K *5/34, 3/32, 5/16, 5/21*
U.S. Cl. 524—414 **3 Claims**

1. Self-extinguishing polymeric compositions consisting of an olefinic polymer and, on the total weight of the composition, from 1to 5% of red phosphorus, from 0% to 10% of a substance capable of mainly freeing ammonia by thermal decomposition, and from 0.3% to 2% of a promoter of free radicals selected from the group consisting of 3,4-dimethyl-3,4-diphenylhexane and 2,3-dimethyl-2,3-diphenylbutane.

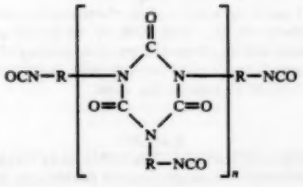
4,442,256

ADDITIVE FOR ALKYD RESIN COATING COMPOSITIONS

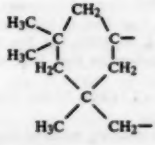
Lester I. Miller, Troy, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1982, Ser. No. 450,220
Int. Cl.³ C09D *3/52, 3/66*
U.S. Cl. 524—539 **7 Claims**

1. An additive for alkyd resin coating compositions consisting essentially of about 10–50% by weight of isocyanato isocyanurate having the formula



wherein R is



and n is an integer of 1–5,
wherein the isocyanato isocyanurate is formed from 3-isocyanatomethyl-3,5,5-trimethyl-cyclohexyl isocyanate and has an isocyanate functionality of 3.0–4.0;
0.5–5% by weight of dibutyltindilaurate and
49.5–89.5% by weight of an organic solvent.

4,442,257

LOW TEMPERATURE CURE LATEXES

David A. Borovicka, Sr., Parma; Kenneth G. Hahn, Jr., Hinckley, and John T. Tupa, Broadview Hts., all of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 264,419, May 18, 1981, abandoned. This application Oct. 22, 1982, Ser. No. 436,188
Int. Cl.³ C08L *75/00*
U.S. Cl. 524—555 **11 Claims**

1. A stabilized aqueous thermosetting low temperature curable composition containing a polymeric composition dispersed in water, comprising on a weight basis:
between 5% and 60% of dimethylol dihydroxy ethylene urea, and between 40% and 95% emulsion polymer wherein said emulsion polymer contains polymerized ethylenically unsaturated monomers comprising between 0% and 10% carboxylic monomer, 2% and 20% alkylhydroxyl acrylate or methacrylate monomer, and the balance being other ethylenically unsaturated monomer comprising monomers selected from vinyl monomers, styrene monomers or acrylate monomers, whereby said emulsion polymer contains reactive groups for cross-linking reaction with said dimethylol dihydroxy urea.

4,442,258

WATER-SOLUBLE PRESSURE-SENSITIVE ADHESIVE COMPOSITION

Makoto Sunakawa; Yutaka Moroishi, and Isao Mune, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 3, 1980, Ser. No. 165,825
Claims priority, application Japan, Jul. 4, 1979, 54-85292
Int. Cl.³ C08K *5/05, 5/06*
U.S. Cl. 524—767 **19 Claims**

1. A water-soluble pressure-sensitive adhesive composition comprising a composition obtained by the solution polymerization of a water-soluble ethylenically unsaturated monomer in the presence of a solvent and an alcoholic plasticizer selected from the group consisting of polyether polyols and polyhydric alcohols, said alcoholic plasticizers having an average molecular weight of less than about 3,000 and which is liquid at room temperature,
wherein said composition contains as a polymer component at least an addition copolymer of the unsaturated monomer and the alcoholic plasticizer, wherein the alcoholic plasticizer is present in an amount of from 20 to 400 parts by weight per 100 parts by weight of the unsaturated monomer.

4,442,259

AQUEOUS-BASED POLYURETHANE COMPOSITIONS AND METHOD OF PREPARATION

Irving E. Isgur, Framingham, and William D. DelVecchio, Randolph, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Apr. 26, 1982, Ser. No. 371,631
Int. Cl.³ C08L *75/00*
U.S. Cl. 524—839 **26 Claims**

1. A method of preparing an aqueous based polyurethane adhesive solution comprising the steps of:
providing a reaction mixture comprising an isocyanate-terminated urethane prepolymer and an equivalent excess of water, based on the isocyanate content of said prepolymer;
reacting said prepolymer and said water to effect chain extension of said prepolymer;

controlling the rate of said chain extension by adding to said reaction mixture a monofunctional isocyanate group blocking agent and permitting reaction between said agent and isocyanate groups in said prepolymer;

permitting said prepolymer and said water to react until said reaction mixture acquires a desired adhesive capability; and

adding to said reaction mixture additional said monofunctional isocyanate group blocking agent or a second isocyanate group blocking agent in an amount at least substantially equal to the remaining unreacted isocyanate groups in said prepolymer on an equivalent basis.

4,442,260

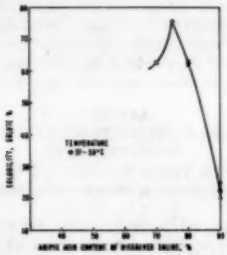
PREPARATION OF SALT SOLUTION USEFUL FOR MAKING NYLON

Howland A. Larsen, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Mar. 14, 1983, Ser. No. 475,030

Int. Cl.³ C08G *69/28*

U.S. Cl. 524—845 **1 Claim**



1. A process for making 66-nylon salt solution which comprises, in sequence

(a) preparing a water solution in which the solute phase contains 73.5–77.5% adipic acid and 22.5–26.5% hexamethylene diamine, by weight, at a temperature of 55°–60° C. in which the total solute concentration is 60–69% and the water concentration is 31–40%, and

(b) concentrating the solution by evaporating water until the solute comprises between 89 and 96%, by weight, and

(c) adding hexamethylene diamine until the hexamethylene diamine and adipic acid are in about stoichiometric proportions.

4,442,261

CATIONICALLY POLYMERIZABLE MACROMOLECULAR MONOMERS AND GRAFT COPOLYMERS THEREFROM

Joseph P. Kennedy, Akron, Ohio, and Kurt C. Frisch, Jr., Midland, Mich., assignors to The University of Akron, Akron, Ohio

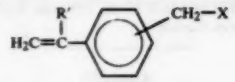
Division of Ser. No. 199,656, Oct. 22, 1980, Pat. No. 4,327,201. This application Jan. 11, 1982, Ser. No. 338,502

Int. Cl.³ C08F *291/02, 291/06, 255/10*

U.S. Cl. 525—324 **22 Claims**

1. A graft copolymer comprising the reaction product of a copolymerizable monomer and a cationically prepared macromolecular monomer,

said macromolecular monomer being the reaction product of a cationically polymerizable monomer and a vinyl substituted hydrocarbon halide having the formula:



where R′ is a hydrocarbon having from 1 to 18 carbon atoms, and wherein X is selected from the group consisting of F, Cl, Br, and I,

in said reaction the amount of said vinyl substituted hydrocarbon halide is from about 5.0 moles to about 1.0×10^{-5} moles per mole of said cationically polymerizable monomer, and

wherein said macromolecular monomer has polymerizable head groups, said polymerizable head groups being vinyl or substituted vinyl groups,

wherein said monomer forming said cationically prepared macromolecular monomer is isobutylene, and

wherein said copolymerizable monomer is selected from the group consisting of a free-radically polymerizable monomer, a cationically polymerizable monomer, an anionically polymerizable monomer, a coordinately polymerizable monomer, and combinations thereof.

4,442,262

COMPOSITION OF POLYESTER-BLOCK COPOLYMER

Haruhiko Yusa; Mitsuru Hoshino; Akira Kurosaki, all of Iwaki; Hironobu Furusawa, and Chikara Sugitawa, both of Ohtsu, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha and Toyo Boseki Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 17, 1981, Ser. No. 322,152

Claims priority, application Japan, Nov. 22, 1980, 55-164909; Nov. 22, 1980, 55-164910

Int. Cl.³ C08F *8/00*; C08L *51/00*

U.S. Cl. 525—69 **12 Claims**

1. A polyester-block copolymer composition which comprises 95% to 20% by weight of a polyester-block copolymer obtained by the copolymerization of 95% to 20% by weight of hard polyester segments having a melting point higher than 150° C., and 5% to 80% by weight of polymer segments having a melting point of less than 80° C. and a molecular weight of 400 to 20,000; and

5% to 80% by weight of at least one of a graft-copolymer formed by graft copolymerization of:

50 to 25 parts by weight of a monomeric mixture comprised of 90% to 10% by weight of styrene and 10% to 90% by weight of methyl methacrylate, and 0.01% to 3% by weight of a cross-linking agent, with

50 to 75 parts by weight of an elastomeric trunk polymer containing not less than 50% by weight of rubber like segments selected from the group consisting of butadiene units and C_4 to C_4-alkyl acrylate units, and 3.0% to 0.01% by weight of a cross-linking agent.

4,442,263

THERMOPLASTIC MOLDING MATERIALS

Franz Brandstetter, Neustadt; Juergen Hambrecht, Heidelberg; Rudolf Stephan, Ludwigshafen; Heinz-Juergen Overhoff, Frankenthal; Josef Schwaab, Maikammer; Claus Bernhard, Eisenberg; Johann Swoboda, and Adolf Echte, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 16, 1982, Ser. No. 398,822

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 3129472

Int. Cl.³ C08L *51/04, 51/06*

U.S. Cl. 525—83 **2 Claims**

1. A thermoplastic molding material essentially containing

(A) 50–90% by weight, based on A+B, of a hard component comprising one or more copolymers of styrene or α-methylstyrene, or of styrene and α-methylstyrene, with

acrylonitrile, these copolymers containing from 20 to 40% by weight of acrylonitrile as copolymerized units, and

(B) 50–10% by weight, based on A + B, of a graft copolymer comprising

(B_1) 40–80% by weight, based on (B), of one or more cross-linked acrylate polymers having a mean particle size of not more than 0.8 μm (d_{50} value of the cumulative mass distribution) and a glass transition temperature, Tg, below 0° C., onto which is grafted

(B_2) 20–60% by weight, based on (B), of one or more mixtures of styrene and acrylonitrile in a weight ratio from 88:12 to 65:35,

wherein the mean particle size of the grafting base (B_1) is >0.5 μm and the particle distribution, expressed by the ratio

$$Q = \frac{d_{90} - d_{10}}{d_{50}},$$

is ≧0.6.

4,442,264

GRAFT RUBBERS FOR MODIFYING THERMOPLASTIC MOULDING COMPOSITIONS

Karl Zabrocki, Buettgen, and Alfred Pischtschan, Kuerten, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

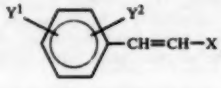
Filed May 2, 1983, Ser. No. 490,541

Claims priority, application Fed. Rep. of Germany, May 12, 1982, 3217874

Int. Cl.³ C08L *51/04, 55/02, 279/02*

U.S. Cl. 525—86 **8 Claims**

1. A graft rubber obtainable by the radical polymerisation of one or more vinyl-group-containing monomers in the presence of at least one rubber, wherein polymerisation is carried out in the presence of from 0.001 to 1.0% by weight (based on solid graft product) of at least one compound corresponding to the general formula (I)



(I)

in which

X represents Cl or NO_2;

Y^1 and Y^2, which may be the same or different, represent H, C_1–C_{10}-alkyl, NO_2, F, Cl or Br.

4,442,265

POLYMERIC BLENDS

John R. Haws, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 286,097, Jul. 22, 1981, Pat. No. 4,393,170, which is a continuation of Ser. No. 145,091, Apr. 30, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,249

Int. Cl.³ C08L *53/00*

U.S. Cl. 525—91 **18 Claims**

1. A composition of matter that is a blend of polymers comprising:

(a) a block copolymer of lactone with conjugated diene,

(b) acrylic ester polymer, and

(c) coumarone-indene resin.

4,442,266

MELT SPINNING OF POLYPROPYLENE

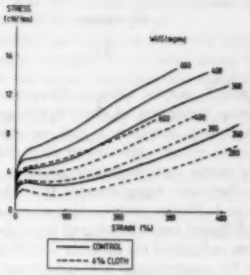
Harry Brody, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 29, 1981, Ser. No. 268,252

Claims priority, application United Kingdom, May 13, 1981, 8114626

Int. Cl.³ C08L *67/06*

U.S. Cl. 525—173 **5 Claims**



1. A process of melt spinning polypropylene the improvement comprising adding to the polypropylene before it is melt spun, a small proportion of a polymer capable of forming an anisotropic melt in the temperature range at which the polypropylene may be melt spun and then melt spinning the polymers together at a wind up speed of less than 1000 meters per minute whereby in the process there is a suppression of wind up speed compared with the process carried out in the absence of the added polymer.

4,442,267

HEAT RESISTANT TOUGHENED ADHESIVE COMPOSITION

Ronald S. Charnock, Celbridge, Ireland, assignor to Loctite (Ireland) Limited, Tallaght, Ireland

Filed Mar. 17, 1983, Ser. No. 476,395

Int. Cl.³ C08F *255/02*

U.S. Cl. 525—309 **12 Claims**

1. In a two-component adhesive composition of the type having a first component comprising a solution of polymer in at least one polymerizable monomer in combination with an adhesion promoter and a free radical catalyst system, and a second component comprising an activator, an improved composition providing increased high temperature resistance in the cured adhesive wherein: said polymer is present at levels of 30% or more of the total composition and is a copolymer of ethylene and methyl acrylate having a glass transition temperature below 15° C., a Mooney viscosity of between about 25 and about 60 ML (1+4) at 100° C. and a molecular weight in excess of 5,000; said monomer is an acrylate ester; and said composition when cured does not exhibit significantly decreased shear strength after high temperature aging when compared to the shear strength of said composition when cured at room temperature.

4,442,268

N-(SUBSTITUTED PHOSPHINYL) POLYAMIDES

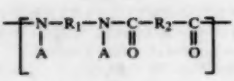
Alexandros K. Tsolis, 171 Old National Road, Arahovitika, Patra, Greece

Filed Aug. 4, 1981, Ser. No. 290,087

Int. Cl.³ C08G *69/48, 69/42*

U.S. Cl. 525—420 **5 Claims**

1. A solid N-(substituted phosphinyl) polyamide consisting essentially of the recurring structural unit represented by the formula:



wherein A is from 0.9 to 0.4 mol hydrogen and from 0.1 to 0.6 mol substituted phosphinyl radical of the formula

wherein X_1 and X_2 are the same or different radicals selected from the group consisting of dimethylamino, diethylamino, aziridinyl, hydroxy, substituted and unsubstituted radicals selected from the group consisting of alkyl and alkoxy having 1 to 4 carbon atoms, cyclohexyloxy, phenoxy, benzyloxy and phenyl, the substituents being selected from the group consisting of from 1 to 4 chlorine and bromine atoms; R_1 and R_2 being the same or different radicals selected from the group consisting of alkylene radicals of the formula $-(CH_2)_m-$, wherein m is from 2 to 10 unsubstituted and substituted m-arylene and p-arylene, wherein the substituent is selected from the group consisting of 1 to 2 chlorine and bromine atoms.

4,442,269

STAGED COPOLYMERIZATION OF POLYESTERS

Eugene G. Sommerfeld, Mt. Laurel, N.J., and Andrew P. Stamegna, Claymont, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 15, 1982, Ser. No. 450,135

Int. Cl.³ C08L 67/02

U.S. Cl. 525—440 **12 Claims**

1. A non-equilibrium, two-stage polymerization process conducted without external catalysts for producing polyester copolymers having a linear segment with terminal hydroxyl groups and a number average molecular weight (Mn) of at least about 500 and a branched segment with lateral hydroxyl groups wherein

in the first stage of the process one half of the carboxyl groups of a diacid or a diacid anhydride are reacted in approximately stoichiometric proportions with one of (A) one half of the hydroxyl groups of the linear segment and (B) 10–80% of the hydroxyl groups of the branched segment to form a first reaction product, and then

in the second stage of the process the other half of the carboxyl groups of the first reaction product are reacted in approximately stoichiometric proportions with the hydroxyl group of the other of (A) and (B).

4,442,270

THERMOSETTING POWDER COATING COMPOSITIONS

David T. Passmore, Golborne, England; Willis C. Wooten, Kingsport, Tenn., and Paul McBride, Crescent Green, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 278,228, Jun. 29, 1981, Pat. No. 4,387,214. This application Feb. 8, 1983, Ser. No. 464,804

Int. Cl.³ C08L 63/00, 61/28, 67/02

U.S. Cl. 525—440 **13 Claims**

1. A thermosetting composition comprising

(a) a linear saturated crystalline polyester of an acid moiety and a moiety of a dihydric alcohol, at least 40 mole percent of the acid moiety being a terephthalic or isophthalic acid moiety, said polyester containing as moieties of the dihydric alcohol at least 40 mole percent 1,6-hexanediol, said polyester being further characterized as having a molecular weight of about 700–3000, a melt viscosity of about 50–3000 cps at 160° C. and a hydroxyl number of about 35–160, and

(b) from about 10 to about 40%, based on the weight of said polyester, of a curing agent which is reactive with hydroxyl groups to crosslink said polyester.

4,442,271

PREPARATION OF PROPYLENE HOMOPOLYMERS OR COPOLYMERS

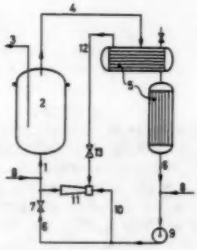
Wolfgang Rau, Heidelberg; Helmut Klamann, Ludwigshafen, and Peter Hennenberger, Freinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 26, 1982, Ser. No. 382,344

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123115

Int. Cl.³ C08F 2/34, 10/06

U.S. Cl. 526—61 **1 Claim**



1. A process for the preparation of a propylene homopolymer or copolymer which contains more than 50% by weight of propylene and less than 50% by weight of other α-monoolefins, of 2 to 6 carbon atoms, as copolymerized units, by polymerizing the monomer or monomers in the presence of hydrogen as a molecular weight regulator, using a Zielger-Natta catalyst, at from 40° to 150° C., under a total pressure of from 10 to 50 bar, in the gas phase in a stirred loose bed of finely divided polymer, with removal of the heat of polymerization by evaporative cooling, the monomer mixed with hydrogen being introduced continuously or batchwise into a polymerization kettle, and the polymer being discharged continuously or batchwise from the polymerization kettle, with the provisos that

(a) the pressure and temperature in the polymerization kettle are maintained within a range corresponding to the gaseous state of the monomer,

(b) gaseous unpolymerized monomer mixed with hydrogen is discharged from the polymerization kettle, the monomer is liquefied and stored in a condenser-cooler-accumulator system and is reintroduced, as liquid, into the polymerization kettle,

(c) the temperature in the stirred loose bed is regulated by continuously measuring it and, if there is a temperature change, varying, the amount of liquid monomer, vaporizing in the polymerization kettle, which is introduced per unit time, and

(d) the monomer consumed by polymerization, plus any monomer discharged with the polymer, is replaced by supplying fresh monomer through one or more lines and the hydrogen required to maintain the desired concentration is replenished, wherein

(e) liquid monomer is taken from the condenser-cooler-accumulator system by means of a pump,

(f) a proportion of the liquid monomer taken off by means of the pump is introduced into the polymerization kettle by means of a branch line via an ejector, with the liquid monomer as the jetting medium,

(g) the gaseous phase remaining in the condenser-cooler-

accumulator system is fed to the polymerization kettle by means of a line, via the intake side of the ejector, and

(h) the amount of the gaseous phase which remains in the condenser-cooler-accumulator system and is taken off via the line is so regulated, by means of a valve, that the amount of gaseous phase actually remaining in the system remains constant.

4,442,272

PRODUCTION OF COPOLYMERS USING SHORTSTOP AGENT AT END OF POLYMERIZATION

Herbert Brooks, Twyford, and Frederick A. Waite, Farnham Common, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 17, 1981, Ser. No. 293,334

Claims priority, application United Kingdom, Sep. 17, 1980, 8030043

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.³ C08F *2/26*

U.S. Cl. 526—82 **10 Claims**

1. A process for the production of a copolymer from a mixture consisting of (i) a monomer selected from alkylstyrenes in which the alkyl group contains from 3 to 6 carbon atoms, the acrylic and methacrylic acid esters of aliphatic monohydric alcohols containing from 6 to 18 carbon atoms, vinyl esters of aliphatic carboxylic acids containing from 6 to 18 carbon atoms and vinyl ethers of aliphatic monohydric alcohols containing from 6 to 18 carbon atoms; (ii) from 2% to 8%, based on the total monomer mixture, of acrylic acid or methacrylic acid; and (iii) from 0% to 25%, based on the total monomer mixture, of one or more monomers selected from the acrylic and methacrylic esters of aliphatic monohydric alcohols containing from 1 to 4 carbon atoms, 2-ethoxyethyl methacrylate, acrylonitrile, vinyl acetate and vinyltoluene, the process comprising the emulsion polymerisation, in a wholly aqueous diluent as hereinbefore defined, of the said monomer mixture and being characterised by the following features in combination:

(a) the ratio of the total weight of monomer mixture which is polymerised in the process to the weight of liquid diluent is from 1:19 to 3:2 by weight;

(b) there is present in the reaction mixture an anionic surfactant at a concentration in the range 3% to 20% of the total weight of monomer mixture which is polymerised;

(c) the reaction mixture is stirred at a temperature in the range 15°–60° C. for a period of from 6 to 10 hours in the presence of an inert gas atmosphere;

(d) there is added to the reaction mixture, after the establishment of the inert gas atmosphere, in an amount of 0.05% to 1.0% based on the weight of monomer mixture, a water-soluble initiator which is effective at the chosen polymerisation temperature;

(e) there is added to the reaction mixture when polymerisation of the monomers is complete, in an amount of from 0.001% to 0.1% based on the weight of monomer mixture taken, a chain transfer agent.

4,442,273

PROCESS AND APPARATUS FOR CONTINUOUS POLYMERIZATION OF A MONOVINYL AROMATIC MONOMER

David S. Neiditch, Evansville, Ind.; Gerald A. Bullano, Glen Mills, Pa.; Robert J. DiLullo, Paoli, Pa., and David E. Ofstein, West Chester, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 6, 1983, Ser. No. 482,391

Int. Cl.³ C08F *2/06*

U.S. Cl. 526—88 **10 Claims**

1. The process for continuous anionic solution polymerization of a monovinyl aromatic monomer to produce a polymer having a low weight average molecular weight to number average molecular weight ratio, comprising:

continuously feeding a solution of a monovinyl aromatic monomer in an inert solvent, and a hydrocarbyllithium initiator in an inert solvent, to form a mixture in the bottom zone of a sealed, cylindrical, pressurized, vertical reactor having a bottom zone, a top zone, and a plurality of intermediate zones, each said zone separated from an adjacent zone by separation plates having a central aperture therethrough, and stirring means carried by a central shaft passing through said apertures with an annular space provided between the shaft and each said separation plate;

continuously passing said mixture from the bottom zone to successive zones through the annular space between the shaft and each said separation plate, said annular space being dimensioned so as to provide a high interstage velocity relative to superficial velocity and pressure differential of less than one pound per square inch between said successive zones;

stirring said mixture while passing the same through each zone; and cooling the reaction if necessary by means of a zoned-jacket or pumparound loop for each zone; and

continuously removing a solution of polymer from the top zone.

4,442,274

POLYMERIZATION PROCESS USING A PHOSPHATE CONTAINING SUPPORT FOR VANADIUM CATALYST

Max P. McDaniel, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 221,752, Dec. 31, 1980, Pat. No. 4,397,761. This application Sep. 27, 1982, Ser. No. 423,597

Int. Cl.³ C08F *4/02, 4/68*

U.S. Cl. 526—95 **36 Claims**

1. A polymerization process comprising:

contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule in a reaction zone under polymerization conditions with a catalyst system comprising:

(a) a catalyst comprising an activated vanadium compound on a phosphate-containing support;

(b) an organoaluminum cocatalyst of the formula R_nAlX_{3-n} wherein R is a 1 to 12 carbon atom alkyl radical, n is a number between 1 and 2 inclusive, and X is a halogen; and

recovering a polymer.

4,442,275

POLYMERIZATION PROCESS USING CATALYST HAVING AQUEOUS TITANATION OF SUPPORT WITH SOLUBILIZED $Ti(OR)_4$

Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 356,582, Mar. 9, 1982. This application Sep. 29, 1982, Ser. No. 426,332

Int. Cl.³ C08F *4/02, 4/24*

U.S. Cl. 526—96 **10 Claims**

1. A process comprising:

(a) reacting a titanium hydrocarbyloxide of the formula $Ti(OR)_4$ where R is a hydrocarbyl radical, with a polyhydroxy organic compound to give a reaction product;

(b) combining the thus formed product with an aqueous solution of a strong acid to form a water soluble titanium composition;

(c) combining said water soluble titanium composition while in solution with an inorganic catalyst support and a chromium compound;

(d) activating the resulting combined product of (c) by heating at an elevated temperature in an oxygen containing ambient to produce a catalyst; and

contacting at least one mon-1-olefin having 2 to 8 carbons

atoms per molecule with said catalyst in a reaction zone under polymerization conditions to produce a polymer.

4,442,276

PROCESS FOR POLYMERIZING OR COPOLYMERIZING OLEFINS

Norio Kashiwa, Iwakuni, and Yoshihisa Ushida, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,176
Int. Cl.³ C08F *4/02, 10/00*
U.S. Cl. 526—125 **7 Claims**

1. A process for polymerizing or copolymerizing olefins, which comprises polymerizing or copolymerizing olefins in the presence of a catalyst composed of

(A) a solid titanium catalyst component obtained by reacting (i) a titanium composition composed essentially of tetravalent titanium, magnesium, halogen and an electron donor or electron donor residue selected from the group consisting of organic acid esters, alkoxy groups and aryloxy groups with (ii) an organic silicon compound having an Si—O—C bond in the molecule in the presence of (iii) an organoaluminum compound, until the content of the electron donor or electron donor residue in the titanium composition (i) decreases to not more than 90 mole% of that before the reaction and reaches not more than 0.6 mole per gram-atom of Ti, and also until the amount of the silicon compound contained in the titanium composition becomes 0.1 to 50 moles per gram-atom of Ti or by first treating the titanium composition (i) with the organoaluminum compound (iii) and then reacting it with the organic silicon compound (ii), until the amount of the electron donor or electron donor residue in the titanium composition (i) decreases to not more than 90 mole% of that before the reaction, and reaches not more than 0.6 mole per gram atom of Ti, thus including 0.1 to 50 moles of the silicon compound per gram-atom of Ti in the titanium composition, and;

(B) an organoaluminum compound.

4,442,277

PROCESS AND CATALYST FOR OLEFIN POLYMERIZATION

Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 241,975, Mar. 9, 1981, Pat. No. 4,400,303. This application Sep. 22, 1982, Ser. No. 421,222
Int. Cl.³ C08F *4/02, 10/02*
U.S. Cl. 526—125 **14 Claims**

1. A process for producing polymers of ethylene comprising contacting monomers comprising ethylene with a catalyst system comprising:

(a) a cocatalyst comprising an organometallic compound of a metal of Groups I, IIA, and IIIA of the Periodic Table, and

(b) a catalyst prepared by

(1) pretreating solid particles of magnesium dihalide by pulverizing said particles in the presence of at least one oxy compound of the formula

$$RC(OR'')_3$$

wherein R is selected from hydrogen and alkyl radicals having 1 to 4 carbon atoms and each R'' is individually selected from alkyl radicals containing 1 to 4 carbon atoms, and then

(2) reacting said pretreated solid particles with a halogenated titanium compound of the formula $TiX_n(OR''')_{4-n}$ wherein R''' is a hydrocarbyl radical containing 1 to 12 carbon atoms, X is a halogen, and n is an integer of 1 to 4 in the absence of any substantial pulverization.

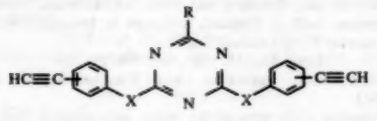
4,442,278

ETHYNYL-SUBSTITUTED S-TRIAZINE DERIVATIVES, POLYMERS THEREOF AND PROCESS FOR MAKING THE SAME

Thomas W. Giants, Santa Monica, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

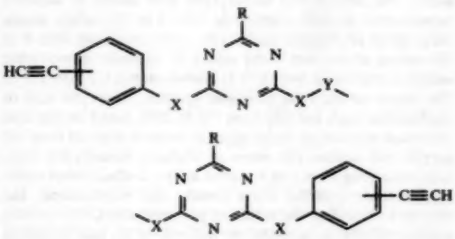
Filed Dec. 3, 1981, Ser. No. 326,792
Int. Cl.³ C08F *126/06*
U.S. Cl. 526—261 **2 Claims**

1. A polymer prepared by thermal curing from an oligomer having the structure

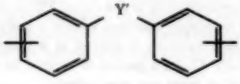


where X, is a single bond, O, S, NR', $(CH_2)_n$, $C(C_nH_{2n+1})_2$, or $[C(Ar_2)]_n$, where Ar is aryl, R is alkyl, alkoxyl, aryl, or aryloxy, R' is H, alkyl or aryl, and n ranges from 1 to about 4.

2. A polymer prepared by thermal curing from an oligomer having the structure



where X is a single bond, O, S, NR', $(CH_2)_n$, $C(C_nH_{2n+1})_2$ or $[C(Ar_2)]_n$ where Ar is aryl, R' is H, alkyl, or aryl, and n ranges from 1 to about 4; R is alkyl, alkoxy, aryl, or aryloxy, and Y is a divalent moiety whose structure is



where Y' may be $C(CF_nH_{3-n})_2$ where n ranges from 0 to 3, CO, SO_2, S, or O.

4,442,279

COMPOSITIONS CONTAINING ISOCYANATOSILANES AS ADDITIVES TO INCREASE THE STABILITY IN STORAGE OF COMPOSITIONS CONTAINING POLYURETHANE PREPOLYMERS WITH FREE ISOCYANATE GROUPS

Rudolf Fauss, Cologne; Michael Sonntag, Odenthal; Kuno Wagner, Leverkusen; Kurt Findeisen, Odenthal, and Gerhard Mennicken, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,338
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204128
Int. Cl.³ C08G *18/00*
U.S. Cl. 528—44 **6 Claims**

1. A liquid or pasty, clear or pigmented composition comprising:

(a) a polyurethane prepolymer having free isocyanate groups,

(b) an isocyanatosilane corresponding to the formula

$R_nSi(NCO)_{4-n}$

wherein

R denotes an alkyl group having 1 to 6 carbon atoms and

R represents 0 or an integer from 1 to 3 in an amount sufficient to increase the storage stability of said composition and, optionally,

(c) a solvent which is inert towards isocyanate groups.

4,442,280

HETEROGENEOUS SYSTEMS OF POLYOL/DIPHENYL METHANE URETDIONE DIISOCYANATES AND A PROCESS FOR THEIR PRODUCTION

Gerhard Grögler, Leverkusen, and Wilhelm Kallert, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 2, 1982, Ser. No. 404,010

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131780

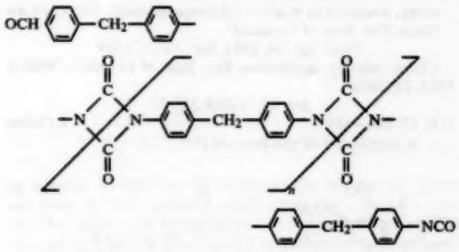
Int. Cl.³ C08G *18/77, 18/79, 18/24, 18/26*

U.S. Cl. 528—54 29 Claims

1. A storage stable, low molecular weight, substantially water free heterogeneous composition which may be hardened to form a polyurethane by exposure to heat comprising:

(a) one OH-equivalent of difunctional or polyfunctional polyhydroxyl compounds having a molecular weight from 1,000 to 10,000;

(b) (i) 0.8 to 1.5 NCO-equivalents of 4,4'-diphenyl methane uret dione diisocyanates corresponding to the formula:



in which n=0 to 2.5 or

(ii) 0.8 to 12 NCO-equivalents of a 4,4'-diphenyl methane uret dione diisocyanate modified by a difunctional or polyfunctional compound containing OH-groups attached to aliphatic and/or cycloaliphatic groups and/or aromatic NH_2-groups which modifying compound has a molecular weight from 62 to 400; and

(c) 0.001 to 5 wt. % (based on (a)+(b)) of a lead and/or tin catalyst.

4,442,281

THERMOPLASTIC POLYURETHANE-ELASTOMERS FROM CYCLOHEXANE-1,4-DIISOCYANATE

Peter Hentschel, Laudenbach; Walter Brodowski, Amorbach, and Hans Zengel, Kleinwallstadt, all of Fed. Rep. of Germany, assignors to AKZO nv, Arnheim, Netherlands

Filed Sep. 6, 1983, Ser. No. 529,531

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1982, 3233384

Int. Cl.³ C08G *18/32*

U.S. Cl. 528—79 26 Claims

1. Thermoplastically workable polyurethane-elastomers, obtained by polyaddition of substantially pure trans-cyclohexane-1,4-diisocyanate, marcrodiols of an average molecular weight from 800 to 4000 and chain lengtheners having at least two active hydrogen atoms, said chain lengtheners composed of bisethoxylated Bisphenol A or mixtures of bisethoxylated Bisphenol A with other short-chain diols customarily employed as chain lengtheners.

4,442,282

POLYURETHANE COVERED GOLF BALLS

Edmond G. Kolycheck, Lorain, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 20, 1983, Ser. No. 505,585

Int. Cl.³ C08G *18/42;* A63B *37/12*

U.S. Cl. 528—83 3 Claims

1. A golf ball comprising a core and a polyesterurethane cover comprising the reaction product of a polyester of an aliphatic diol containing 2 to 8 carbon atoms and 1,12-dodecanedioc acid, said polyester having a molecular weight of about 1500 to about 5000, reacted with diphenylmethane-4,4'-diisocyanate in a molar ratio of about 0.96 to 1.02 mols of diisocyanate per mol of polyester, the melt index of the polyesterurethane being in the range of about one to ten.

4,442,283

POLYIMIDE ADHESIVE FROM LACTAM, AROMATIC DIANHYDRIDE, ALIPHATIC DIANHYDRIDE AND DIAMINE

John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 Lexington Pl., El Cajon, Calif. 92021

Filed Sep. 27, 1982, Ser. No. 423,801

Int. Cl.³ C08G *69/14*

U.S. Cl. 528—323 15 Claims

1. In the method for preparing a polyimide adhesive which comprises the steps of:

preparing a mixture of an aromatic tetracarboxylic acid dianhydride with an oxime in a mole ratio of oxime to tetracarboxylic acid dianhydride between about 0.01:1 and 1:1 to produce an N-substituted aliphatic imide;

dissolving said imide in a solvent; and

adding thereto a diamine;

the improvement comprising:

adding to the mixture an aliphatic tetracarboxylic acid dianhydride either before or after the mixture is dissolved in said solvent; and

wherein said solvent is a reactive solvent esterifying agent.

4,442,284

CHEMICAL COMPOUNDS, AMINOACID ATTACHED TO GLYCOSIDE

Cenek Kolar, Marburg an der Lahn; Hans Paulsen, Hamburg, both of Fed. Rep. of Germany, and Jean C. Jacquinet, Orleans-La Source, France, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

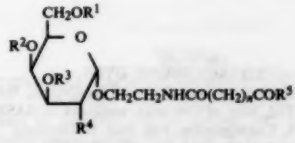
Filed Feb. 22, 1982, Ser. No. 350,887

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1981, 3106815

Int. Cl.³ C07H *15/04*

U.S. Cl. 536—17.9 6 Claims

1. A compound of the formula



wherein R^1 taken alone is hydrogen, acetyl, benzoyl, or benzyl, R^2 and R^3 taken alone are hydrogen, acetyl, benzoyl, benzyl, beta-D-galactopyranosyl, or 2,3,4,6-tetra-O-acetylated beta-D-galactopyranosyl, R^1 and R^2 taken together are alkylidene or benzylidene, R^4 is azido, amino, or acetamido, R^5 is —OCH_3,

—O—benzyl, —$NHNH_2$, —N_3, or —OH, and n is an integer from 1 to 10.

4,442,285

PROCESS FOR SEPARATING GLUCOSE FROM FRUCTOSE BY SELECTIVE ADSORPTION

Richard W. Neuzil, Downers Grove, and James W. Priegnitz, Elgin, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 197,874, Oct. 17, 1980, Pat. No. 4,349,668, which is a continuation-in-part of Ser. No. 690,769, May 27, 1976, abandoned. This application May 4, 1982, Ser. No. 374,819

Int. Cl.³ C07H *1/06*; C13K *1/00*

U.S. Cl. 536—127 **3 Claims**

1. A process for the recovery of glucose from a mixture thereof with fructose which comprises contacting a mixture containing glucose and fructose, at a temperature in the range of from 20° C. to 200° C. and a pressure in the range of from atmospheric to 500 psig, with an X zeolite containing potassium cations at exchangeable cationic sites and selectively adsorbing glucose in said zeolite to separate the same from unadsorbed fructose, and thereafter removing the adsorbed glucose from the zeolite.

4,442,286

PREPARATION OF AMINES BY THE REDUCTION OF IMINES WITH PHOSPHOROUS ACID

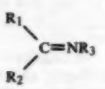
Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 15, 1976, Ser. No. 732,604

Int. Cl.³ C07D *295/02*; C07C *85/08, 85/00*

U.S. Cl. 544—178 **13 Claims**

1. A process of preparing amines which comprises reducing imines of the formula



where R_1 and R_2 are hydrogen, alkyl or R_1 and R_2 may be joined to form a cycloalkyl group, and R_3 may be alkyl, aryl, cycloalkyl, alkaryl, aralkyl or heterocyclic, or enamines with phosphorous acid.

2. The process of claim 1 where an aldehyde and phosphorous acid are first mixed and the mixture then added to an amine whereby an imine or enamine is formed in situ and the final product is an amine.

4,442,287

ANTHRAQUINONE DYES

Ernst Hartwig, Heidelberg, and Reinhold Krallmann, Weisenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

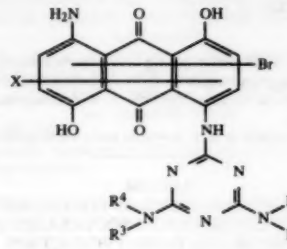
Filed Jun. 30, 1982, Ser. No. 393,609

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127240

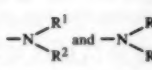
Int. Cl.³ C07D *251/70*

U.S. Cl. 544—187 **2 Claims**

1. A dye of the formula



where X is hydrogen, 4-hydroxyphenyl or 4-methoxyphenyl, and



are each independently —$N(CH_3)_2$ or —$NHCH_3$.

4,442,288

ANTHRAQUINONE COMPOUNDS

Fritz Meininger, Frankfurt am Main, Fed. Rep. of Germany; Joachim W. Otten, deceased, late of Offenbach am Main, Fed. Rep. of Germany; by Ursla Otten, heir, Hiedelberg, and by Anna G. Rudolph, heir, Dillenburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

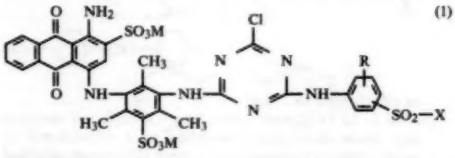
Filed Apr. 30, 1982, Ser. No. 373,789

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117482

Int. Cl.³ C07D *251/50*

U.S. Cl. 544—189 **2 Claims**

1. A compound of the formula (1)



(1)

wherein

M is hydrogen or the equivalent of a metal,

R is hydrogen, halogen, methyl, ethyl, methoxy, ethoxy or carboxy, and

X is vinyl, β-sulfatoethyl, β-thiosulfatoethyl or β-chloroethyl, and

the group of the formula —SO_2—X is bound to the benzene nucleus in the para position with respect to the amino group.

4,442,289

4-OXOTHIENO[3,2-d]PYRIMIDINE ACETIC ACID ESTERS

Frank Kienzle, Flüh, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

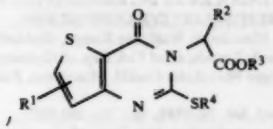
Division of Ser. No. 275,271, Jun. 19, 1981, Pat. No. 4,376,121. This application Dec. 23, 1982, Ser. No. 452,677

Claims priority, application Switzerland, Jun. 27, 1980, 4995/80

Int. Cl.³ C07D *487/04*; A61K *31/505*

U.S. Cl. 544—280 **6 Claims**

1. A compound of the formula



II

wherein R^1 is hydrogen, chlorine, bromine or C_{1-4}-alkyl, R^2 is hydrogen or methyl and R^3 and R^4 is C_{1-4}-alkyl.

3. A compound in accordance with claim 1, 2-methylthio-7-methyl-4-oxothieno[3,2-d]pyrimidine-3(4H)-acetic acid methyl ester.

4,442,290

DEVELOPMENT RESTRAINER RELEASE COMPOUNDS

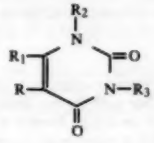
James R. Bartels-Keith, Lexington, and Anthony J. Puttick, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 273,039, Jun. 12, 1981, Pat. No. 4,350,754. This application Mar. 29, 1982, Ser. No. 362,651

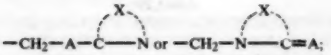
Int. Cl.³ C07D *403/06, 403/12*

U.S. Cl. 544—310 **18 Claims**

1. A compound represented by the formula

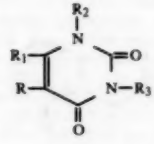


wherein R is

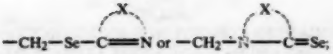


A is sulfur or selenium; X represents the nonmetallic atoms necessary to form a nucleus which completes a tetrazole moiety; R_1 is H or alkyl having from 1 to 6 carbon atoms; R_2 is H or a group which is hydrolyzable upon contact with an aqueous alkaline medium; and R_3 is H, alkyl or a group which is hydrolyzable upon contact with an aqueous alkaline medium.

10. A compound represented by the formula

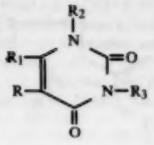


wherein R is

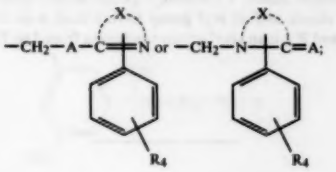


X represents the nonmetallic atoms necessary to form a nucleus which completes a five or six membered heterocyclic moiety; R_1 is H or alkyl having from 1 to 6 carbon atoms; R_2 is H or a group which is hydrolyzable upon contact with an aqueous alkaline medium; and R_3 is H, alkyl or a group which is hydrolyzable upon contact with an aqueous alkaline medium.

15. A compound represented by the formula



wherein R is



A is sulfur or selenium; X represents the nonmetallic atoms necessary to form a nucleus which completes a five or six membered heterocyclic moiety; R_1 is H or alkyl having from 1 to 6 carbon atoms; R_2 is H or a group which is hydrolyzable upon contact with an aqueous alkaline medium; R_3 is H, alkyl or a group which is hydrolyzable upon contact with an aqueous alkaline medium; and R_4 is either a group having a pKa of from about 7 to about 14 which is ionizable to an anion whereby the silver salt of the moiety resulting from cleavage of R is more soluble in the pH range within which R_4 is ionized to an anion that it is below that pH range or a precursor thereof, said precursor being capable of being converted to R_4 upon contact with an aqueous alkaline medium.

4,442,291

1,2,3,4,4A,7-HEXAHYDRO-6,8-DIMETHOXY-2-METHYL ISOQUINOLINE

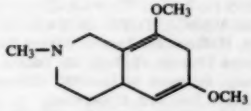
Leo Berger, Montclair, and Gary L. Olson, Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 393,141, Jun. 28, 1982, which is a division of Ser. No. 215,941, Dec. 12, 1980, Pat. No. 4,349,678, which is a division of Ser. No. 73,813, Sep. 10, 1979, Pat. No. 4,260,762, which is a continuation-in-part of Ser. No. 950,947, Oct. 13, 1978, abandoned. This application Mar. 28, 1983, Ser. No. 479,544

Int. Cl.³ C07D *217/24*

U.S. Cl. 546—150 **1 Claim**

1. A compound of the formula



XI

4,442,292

OPTICALLY ACTIVE NICOTINE ANALOGS AND PROCESS FOR THEIR PREPARATION

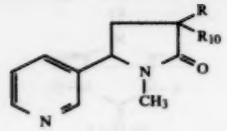
William B. Edwards, III, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 229,481, Jan. 29, 1981, Pat. No. 4,332,945. This application May 13, 1982, Ser. No. 377,990

Int. Cl.³ C07D *401/04*

U.S. Cl. 546—281 **6 Claims**

1. A compound represented by the formula:



wherein R is CO_2R', and R' is selected from the group consisting of a straight chain or branched alkyl group having from 1 to 12 carbon atoms, a cycloalkyl group having from 3 to 12 carbon atoms, and an aryl group having from 6 to 12 carbon atoms; and R_{10} is an alkyl group containing from 1 to 12 carbon atoms.

4,442,293

DI-ACETYLENYL-SUBSTITUTED 2-PHENYLBENZOTHIAZOLES

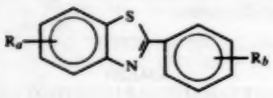
Tsu-Tzu Tsai, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1982, Ser. No. 356,576

Int. Cl.³ C07D *277/66*

U.S. Cl. 548—152 **9 Claims**

1. A compound of the formula



wherein R_a and R_b are —H or —C≡CH, wherein at least one of R_a or R_b is —C≡CH and wherein the location of R_a is −5 or −6 and the location of R_b is −3' or −4'.

4,442,294

PROCESS FOR THE PREPARATION OF HALO-2-MERCAPTOBENZOXAZOLES

Reinhard Handte, Hofheim am Taunus; Jürgen Sander, Kelkheim, and Thomas Tammer, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,209

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1981, 3121675

Int. Cl.³ C07D *263/58*

U.S. Cl. 548—221 **5 Claims**

1. A process for the preparation of 5- and 6-halo-2-mercaptobenzoxazoles or the sodium and potassium salts thereof, as a product, which comprises reacting, as one reactant, the corresponding 4- or 5-halo-2-aminophenols with sodium or potassium lower alkyl xanthates, as the other reactant, in a aromatic or aqueous dispersion in which a heterogeneous phase is present of one of the reactants or where the heterocyclic product is also in a heterogeneous phase.

4,442,295

3-CYANO INDOLES AS INTERMEDIATES FOR CARDIOSELECTIVE COMPOUNDS

Helmut Michel, Mannheim; Wolfgang Kampe, Heddesheim, and Roland Ofenloch, Lorsch, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

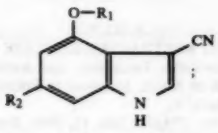
Filed Jul. 29, 1981, Ser. No. 288,077

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3029980

Int. Cl.³ C07D *209/04*

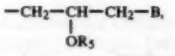
U.S. Cl. 548—505 **6 Claims**

1. An indole of the formula



in which

R_1 is a hydrogen atom, a phenyl-C_{1-4}-alkyl radical or a radical of the formula



B is a chlorine or bromine atom, or a mesyloxy or tosyloxy radical, or together with R_5 is a valency bond,

R_5 is a hydrogen or an acetyl, formyl or benzoyl radical, or together with B is a valency bond, and

R_2 is a hydrogen atom or C_{1-6}-alkyl radical.

4,442,296

4-HETEROCYCLIC-SUBSTITUTED-2-INDANYL ALCOHOLS AND INSECTICIDAL ESTER DERIVATIVES

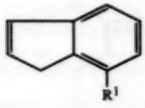
John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 303,292, Sep. 17, 1981, Pat. No. 4,368,205, and a continuation-in-part of Ser. No. 202,813, Oct. 31, 1980, Pat. No. 4,346,251, which is a continuation-in-part of Ser. No. 42,372, May 24, 1979, Pat. No. 4,263,319. This application Dec. 23, 1982, Ser. No. 452,535

Int. Cl.³ C07D *207/323, 333/10*

U.S. Cl. 548—563 **1 Claim**

1. A compound of the formula



wherein R^1 is 2-thienyl or 1-pyrrolyl.

4,442,297

MANGANESE COMPOUNDS AND SORPTION OF GASES USING MANGANESE COMPOUNDS

William E. Hill, Auburn, Ala., and Charles A. McAuliffe, Altrincham, England, assignors to Facilitated Separations, Inc., Towson, Md.

Continuation-in-part of Ser. No. 157,028, Jun. 6, 1980, abandoned. This application May 11, 1981, Ser. No. 262,705

Int. Cl.³ C07F *13/00*

U.S. Cl. 549—206 **18 Claims**

1. A compound of the formula

$$Mn^{II}LX_2(Q)_n \quad (I)$$

wherein L represents a monodentate ligand of the formula

$$PR^1R^2R^3 \quad (II)$$

wherein

R^1, R^2, and R^3 are identical or different and represent alkyl, cycloalkyl, alkenyl, alkynyl, or aryl groups or hydrogen with the proviso that no more than two of R^1, R^2, and R^3 are aryl groups and that at least one of R^1, R^2, and R^3 is a alkyl, cycloalkyl, alkenyl, alkynyl, or aryl group,

X is a species capable of existing as an anion and is selected from the group consisting of Cl, Br, I, CN, NO_2, NO_3, OH, NCS, NCSe, and NCO,

Q is a solvento molecule that forms a chemical bond to the manganese, and

n is the number of solvent donor bonds to the manganese and is 1, 2, or 3.

4,442,298

CHEMICAL SYNTHESIS OF ETHYLENE/MALEIC ANHYDRIDE DIMER WITH PHENYLETHYL END GROUP

Jacob S. Tou, and Alfred A. Schleppnik, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 30, 1982, Ser. No. 413,009

Int. Cl.³ C07D 307/60

U.S. Cl. 549—252 **6 Claims**

1. A method for the chemical synthesis of a phenylethyl substituted dimer of ethylene and maleic anhydride comprising

(a) alkylating alkyl 2,4-dihalobutyrate with alkyl 2-cyano-3-phenylbutyrate,

(b) alkylating the resulting halide condensation product with a carboxylate selected from the group consisting of trialkyl ethane-1,1,2-tricarboxylate and dimethyl cyanoethane-1,2-dicarboxylate,

(c) acid hydrolyzing the resulting tetra or pentaester accompanied by decarboxylating, and

(d) dehydrating the resulting tetra-acid to yield the desired phenylethyl substituted dimer of ethylene and maleic anhydride,

wherein the alkyls in the butyrate and carboxylate ester groups each contain from one to about four carbon atoms and halo is selected from the group consisting of bromo, chloro and iodo.

4,442,299

DIEPOXYCYCLOHEXANE DERIVATIVES

Horst Prinzbach; Reinhard Schwesinger, and Reinhold Keller, all of Freiburg, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

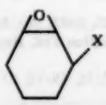
Continuation of Ser. No. 28,738, Apr. 10, 1979, abandoned, which is a continuation of Ser. No. 891,014, Mar. 28, 1978, abandoned, which is a continuation of Ser. No. 710,458, Aug. 2, 1976, abandoned. This application Apr. 22, 1982, Ser. No. 371,014

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1975, 2537682

Int. Cl.³ C07D 303/08

U.S. Cl. 549—545 **3 Claims**

1. A compound of the formula



where the broken line is an oxygen atom bonded in the form of a cis epoxide, and X is endo- or exo-bromine.

4,442,300

THERAPEUTICALLY ACTIVE COMPOUNDS

O. A. Torsten Olsson; Leif Å Svensson, both of Lund, and Kjell I. L. Wetterlin, Sandby, all of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

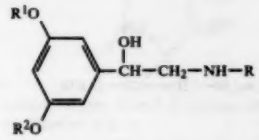
Filed Jul. 1, 1981, Ser. No. 279,467

Claims priority, application United Kingdom, Sep. 7, 1980, 8022440; May 29, 1981, 8116440

Int. Cl.³ C07C 69/773, 69/88, 69/76

U.S. Cl. 560—66 **19 Claims**

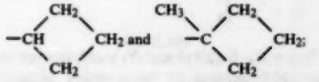
1. A compound of the formula



I

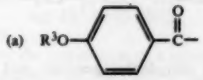
and therapeutically acceptable salts thereof, in which formula R, R^1 and R^2 are as follows:

R is selected from the group consisting of $-C(CH_3)_3$,

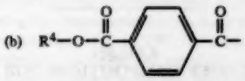


R^1 is selected from the group consisting of H and R^2;

R^2 is selected from the group consisting of



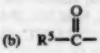
and



in which formulas

R^3 is selected from the group consisting of

(a) H;



wherein R^5 is a straight or branched alkyl group containing 1–4 carbon atoms;

and

and wherein

R^4 is selected from the group consisting of

(b) an alkyl group containing 1–3 carbon atoms.

4,442,301

PROCESS FOR STEREOSELECTIVELY SYNTHESIZING CYCLOPROPANE CARBOXYLATES

Franco Gozzo; Giuseppe Caprara; Lamberto Roberti; Giuseppe Paparatto, and Ettore Santoro, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

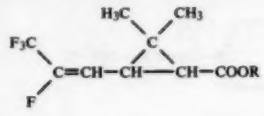
Filed Jun. 29, 1981, Ser. No. 278,676

Claims priority, application Italy, Jul. 2, 1980, 23180 A/80

Int. Cl.³ C07C *69/743*

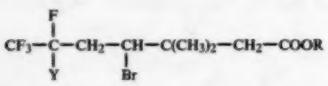
U.S. Cl. 560—124 **15 Claims**

1. A stereoselective process for preparing lower alkyl esters of the cis-2,2-dimethyl-3-(β-trifluoromethyl-β-trifluorovinyl)-cyclopropane carboxylic acid of the formula:



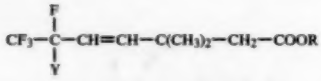
(II-F)

wherein R is a C_1–C_4 alkyl, wherein a compound of the formula



(III-F)

wherein R is a C_1–C_4 alkyl and Y is chlorine or bromine, is monodehydrohalogenated in the presence of a primary or secondary amine and in a non-polar or low polarity solvent, to selectively obtain a compound of formula:



(A')

and subsequently dehydrohalogenating said product by the action of an alkaline base in a non-polar solvent or in ether maintaining, in the latter case, a temperature below 50° C.

4,442,302

PHOTOPOLYMER COMPOSITIONS FOR PRINTING PLATES

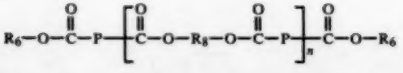
Rudolph L. Pohl, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 175,171, Aug. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 20,778, Mar. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 866,964, Jan. 4, 1978, abandoned. This application Jul. 2, 1982, Ser. No. 394,565

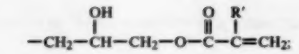
Int. Cl.³ C07C *69/34*

U.S. Cl. 204—159.23 **3 Claims**

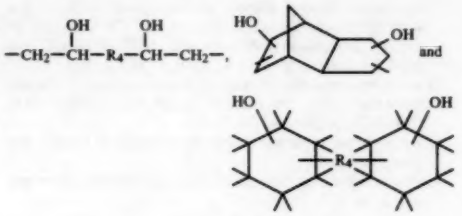
1. A liquid terminally olefinically unsaturated linear polymer having the structure:



wherein P is a polymer residue having a number average molecular weight of at least about 1000 selected from homopolymers of butadiene, isoprene, chloroprene and isobutylene and copolymers of butadiene with styrene, butadiene with acrylonitrile, butadiene with isoprene and ethylene with 1-butene, and the corresponding saturated residues; R_6 is



R_8 is selected from



where each —OH group and free valence bond is on an adjoining carbon atom; R_4 is selected from aliphatic hydrocarbon, cycloaliphatic hydrocarbon and monocyclic aromatic hydrocarbon radicals containing up to 30 carbon atoms with 0–2 ester linkages or 0–7 ether linkages; R' is selected from —H and —CH_3 groups; and n = 1–5.

4,442,303

RECOVERY OF WATER MISCIBLE ORGANIC ACIDS FROM AQUEOUS SOLUTION AS ALKYL ESTERS

Samuel S. Mims, Baton Rouge, La., assignor to El Paso Products Company, Odessa, Tex.

Filed Dec. 9, 1980, Ser. No. 214,790

Int. Cl.³ C07C *67/03, 67/08, 67/54, 67/58, 67/60, 69/003*

U.S. Cl. 560—191 **18 Claims**

1. A process for recovery of C_4–C_6 dicarboxylic acid components contained in an aqueous waste byproduct stream resulting from a primary reaction system in which adipic acid is produced by nitric acid oxidation of cyclohexanone/cyclohexanol, wherein the process comprises the steps of (1) contacting the said aqueous stream with a mixture of C_1–C_3 alkanol and C_6–C_{20} alkanol to esterify the C_4–C_6 dicarboxylic acid components; (2) separating the formed water-immiscible organic ester phase from the aqueous phase; and (3) distilling the said organic ester phase to yield di(C_6–C_{20} alkyl) esters of succinic acid, glutaric acid and adipic acid.

14. A process for recovery of water-miscible organic acid components contained in an aqueous solution which comprises the steps of (1) contacting the said aqueous stream with a mixture of C_1–C_3 alkanol and C_6–C_{20} alkanol under acidic conditions to esterify the organic acid components; (2) separating the formed water-immiscible organic ester phase from the aqueous phase; and (3) distilling the said organic ester phase to recover C_6–C_{20} alkyl esters of the organic acids.

4,442,304

PROCESS FOR PURIFYING AND RECOVERING CONTAMINATED CATALYST SOLUTION OBTAINED IN THE CARBONYLATION OF METHYL ACETATE AND/OR DIMETHYLETHER

Heinz Erpenbach, Cologne; Klaus Gehrmann; Winfried Lork, both of Erftstadt, and Peter Prinz, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 402,942

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1981, 3134350

Int. Cl.³ C07C *67/36, 69/16, 51/56;* B01J *31/40*

U.S. Cl. 560—232 **14 Claims**

1. In a process for purifying and recovering constituents from a contaminated catalyst solution which is obtained as a result of the carbonylation of methyl acetate, dimethylether, or

a mixture of methylacetate and dimethyl ether, the contaminated catalyst solution containing carbonyl compounds of noble metals of group VIII of the Periodic System of the elements, quaternary heterocyclic aromatic nitrogen compounds or quaternary organophosphorus compounds as organic promoters, undistillable organic contaminants, and volatile constituents, including acetic acid, acetic anhydride and ethylidene diacetate, the improvement which comprises: distillatively freeing the catalyst solution from the volatile constituents and water-treating the remaining solid distillation residue, the noble metal/carbonyl-compound being thereby precipitated together with the organic contaminants and the organic promoter becoming dissolved in the water; removing the precipitated and contaminated noble metal/carbonyl-compound by filtration and freeing it from the organic contaminants by extraction with aliphatic ethers; recovering the organic promoter from the water; and recycling the purified noble metal/carbonyl-compound and the recovered organic promoter into the carbonylation reaction.

7. A process as claimed in claim 1 wherein the catalyst solution additionally contains carbonyl-forming non-noble metals as inorganic promoters which, during said water-treatment of said solid distillation residue, are precipitated together with said organic contaminated noble metal/carbonyl-compound, filtered off, purified by extraction with an ether and recycled together with said noble metal/carbonyl-compound to the carbonylation reaction.

10. In a process for purifying and recovering constituents from a contaminated catalyst solution which is obtained as a result of the carbonylation of methyl acetate, dimethylether, or a mixture of methylacetate and dimethylether, the contaminated catalyst solution containing carbonyl compounds of noble metals of group VIII of the Periodic System of the elements, quaternary heterocyclic aromatic nitrogen compounds or quaternary organophosphorus compounds as organic promoters, undistillable organic contaminants, and volatile constituents including acetic acid, acetic anhydride and ethylidene diacetate, the improvement which comprises: distillatively freeing the catalyst solution from the volatile constituents and water-treating the remaining solid distillation residue, the noble metal/carbonyl-compound being thereby precipitated together with the organic contaminants and the organic promoter becoming dissolved in the water; removing the precipitated and contaminated noble metal/carbonyl-compound by filtration and freeing it from the organic contaminants by extraction with aliphatic ethers; removing the organic promoter by extracting it with halogenated hydrocarbons and evaporating said halogenated hydrocarbons; and recycling the purified noble metal/carbonyl-compound and the recovered organic promoter into the carbonylation reaction.

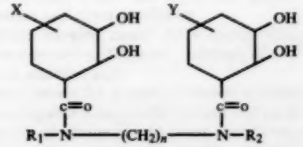
4,442,305

POLYCATECHOLAMIDE CHELATING AGENTS

Frederick L. Weitl, Martinez, and Kenneth N. Raymond, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 24, 1981, Ser. No. 295,512
Int. Cl.³ C07C *101/72*
U.S. Cl. 562—451 **14 Claims**

1. Compound of the formula:



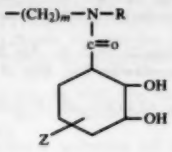
in which:

n is an integer varying from about 1–8, inclusively;

X and Y are independently selected from the group consisting of H, SO_3H, SO_3M, NO_2, and CO_2H, CO_2M;

where M represents a metal selected from the group consisting of alkali metals and alkaline earth metals,

R_1 and R_2 are selected from the group consisting of alkyl and aralkyl hydrocarbon radicals and the benzamide moiety:



where

m is an integer varying from 1–8, inclusively and can be the same or different than n;

Z is selected from the same group as X and Y;

R is selected from the same group as R_1 and R_2.

4,442,306

PRODUCTION OF TERTIARY AMINES

Herbert Mueller, Frankenthal; Hartmut Axel, Schwetzingen, and Arnold Wittwer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 20, 1982, Ser. No. 400,133
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128889
Int. Cl.³ C07C *85/06*
U.S. Cl. 564—479 **8 Claims**

1. A process for the preparation of a symmetrical or asymmetrical tertiary amine of not more than about 40 carbon atoms in total which comprises reacting a secondary amine having identical or different substituents with a primary or secondary monohydric or polyhydric alcohol having 6 or more carbon atoms and having the characteristics of a fatty alcohol, over a copper catalyst, at from 150° to 250° C., in the presence or absence of hydrogen, wherein the catalyst used is formed directly from copper formate under the reaction conditions.

4,442,307

CONVERSION OF DIMETHYL ETHER TO FORMALDEHYDE USING BI-MO-FE CATALYST

Robert M. Lewis, Sugarland; Robert C. Ryan, Houston, and Lynn H. Slaugh, Cypress, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 7, 1982, Ser. No. 433,195
Int. Cl.³ C07C *45/32*
U.S. Cl. 568—470 **4 Claims**

1. A process for converting dimethyl ether to formaldehyde which comprises contacting the dimethyl ether with oxygen at a temperature ranging from about 300 C. to about 600 C. with a catalyst comprising a mixture of oxides of bismuth, molybdenum and iron wherein the catalyst contains about 20 to about 80% by weight of bismuth, measured as the metal, from about 10 to about 50% by weight of molybdenum measured as the metal and from about 0.1 to about 10% by weight, measured as the metal, of iron, exclusive of any inert support.

4,442,308

PROCESS FOR PREPARING BY CATALYTIC OXIDATION IN OXYGEN-CONTAINING GAS MIXTURES, ACROLEIN FROM PROPYLENE AND METHACROLEIN FROM ISOBUTYLENE OR TERTIARY BUTANOL

Dietrich Arntz; Günter Prescher, both of Hanau, and Johannes Heilos, Seligenstadt, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 21, 1982, Ser. No. 390,448

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125061

Int. Cl.³ C07C *45/35, 45/38*

U.S. Cl. 568—480 21 Claims

1. In a process for preparing acrolein from propylene wherein there is carried out an oxidation in oxygen-containing gas mixtures in the presence of an active catalyst material of the composition:

$Ni_aCo_bFe_cBi_dP_eMo_fO_x$ in which a is a number from 2–20, b is a number from 0–15, a and b are a number from 2–20, c is a number from 0.1–7, d is a number from 0.1–4, e is a number from 0.1–4, f is about 12 and x is a number from 35–85, and 0.2 to 5% by weight of tantalum or samarium, calculated as Ta_2O_5 or Sm_2O_3, and a carrier therefor,

said carrier being composed of a layer lattic silicate and/or highly dispersed silica, the weight ratio silicate to silica being 10:1 to 1:1,

the improvement wherein an abrasion resistant coated catalyst is employed, said coated catalyst having an inert support which has a particle size of 0.5 to 6 mm and a rough surface and a coating enclosing said support and anchored in it, which coating is obtained by spraying a suspension of the starting material for the coating onto an agitated bed of the support while the suspending medium is partially removed by a gas stream at 20°–250° C. and an essentially constant residual moisture of the coating is being maintained, and drying and heat-treating,

wherein coated catalysts are used for the oxidation in the preparation of which the support bed is set into mixing motion by mechanical agitation and is simultaneously loosened by blowing in from below a fluidizing, mixing-intensifying gas stream, and a suspension of a precursor of the catalytically active material, which suspension contains a binder, is passed countercurrent to the gas in this bed at a rate which increases with increasing thickness of the coating,

the amounts of suspending medium drawn off and sprayed on being maintained in a substantially constant ratio which is determined by the particular combination of support and precursor used and the thermal expansion coefficients of support and of dried pulverulent precursor being so chosen that they differ by at most 15%,

and wherein after the spraying-on has been completed the coating is densified by continuing the increased mixing motion, the mechanical mixing motion is then stopped, the material is dried in a continuing gas stream and finally heat-treated.

4,442,309

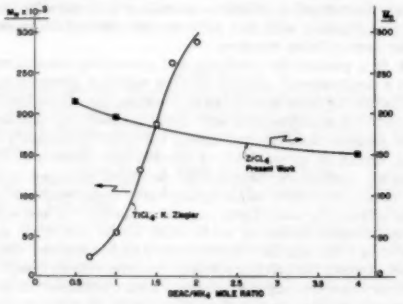
PREPARATION OF LINEAR OLEFIN PRODUCTS

Arthur W. Langer, Jr., Watchung, N.J., assignor to Exxon Reserch and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 179,655, Aug. 20, 1980, Pat. No. 4,409,414, which is a continuation of Ser. No. 10,527, Feb. 9, 1979, abandoned, which is a division of Ser. No. 882,946, Mar. 2, 1978, Pat. No. 4,396,788, which is a continuation of Ser. No. 232,618, Mar. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 783,699, Dec. 13, 1968, Pat. No. 3,662,021, which is a continuation-in-part of Ser. No. 562,089, Jul. 1, 1966, abandoned, which is a continuation-in-part of Ser. No. 428,836, Jan. 28, 1965, abandoned, which is a continuation-in-part of Ser. No. 55,845, Sep. 8, 1960, Pat. No. 3,168,588. This application Dec. 14, 1981, Ser. No. 330,596 The portion of the term of this patent subsequent to Apr. 29, 1986, has been disclaimed.

Int. Cl.³ C07C *2/22*

U.S. Cl. 585—523 6 Claims

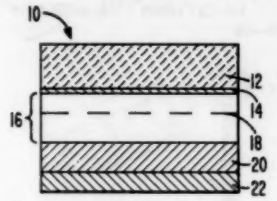


1. A process for preparing and controlling the $\overline{M}_n$ of a reaction product comprising at least 90 mole % linear alpha olefins which comprises polymerizing an ethylene containing gas in the presence of the reaction product of $ZrCl_4$ with R_2AlX, wherein R is an alkyl group having about 1 to about 5 carbon atoms and X is Cl or Br, in the presence of a diluent at a temperature of about 75° to 200° C. and an ethylene pressure above about 50 psia, wherein the mole ratio of ethylene to olefin reaction product is above 0.8 throughout the reaction wherein the product olefin concentration is greater than 5 wt.% based on the diluent and reaction product, wherein the $\overline{M}_n$ of said reaction product is controlled by the molar ratio of said $R_2AlX/ZrCl_4$, said molar ratio being less than about 1.

4,442,310
PHOTODETECTOR HAVING ENHANCED BACK REFLECTION

David E. Carlson, Yardley, Pa., and Brown F. Williams, Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 15, 1982, Ser. No. 398,631
Int. Cl.[3] H01L *31/06*
U.S. Cl. 136—256 19 Claims

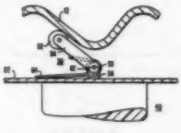


1. A photodetector comprising:
a body including a semiconductor material, having a semiconductor junction therein and having first and second opposed major surfaces;
a first electrical contact to the first major surface through which light impinges on the body;
a light transmissive and electrically conducting spacer layer overlying the second major surface of the body; and
a light reflective second electrical contact overlying the spacer layer;
wherein the optical constants of the second electrical contact, the spacer, layer and the body and the thicknesses of the spacer layer and the body are such that the overall reflectivity of the photodetector is minimized at a particular wavelength of light.

4,442,311
PARTICLE TRAP TO SHEATH CONTACT FOR A GAS-INSULATED TRANSMISSION LINE HAVING A CORRUGATED OUTER CONDUCTOR

William H. Fischer; Alan H. Cookson, and Kue H. Yoon, all of Pittsburgh, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 4, 1982, Ser. No. 439,246
Int. Cl.[3] H01B *9/06, 9/04;* H02G *5/06*
U.S. Cl. 174—14 R 6 Claims

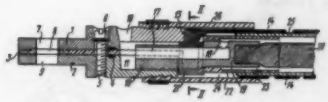


1. A gas-insulated transmission line, comprising:
(A) a corrugated outer conductor;
(B) an inner conductor adapted for connection to an energizing source and disposed interiorly in said outer conductor;
(C) an insulating gas disposed within the annular space between said outer and inner conductors;
(D) insulating means disposed between said outer and inner conductors for insulatingly supporting said inner conductor within said outer conductor;
(E) particle trapping means for trapping foreign particles disposed proximate the inner periphery of said corrugated outer conductor; and
(F) contact means for keeping electrical continuity between said corrugated outer conductor and said particle trapping means for all axial positions of said particle trapping means relative to the corrugations of said corrugated outer conductor, said contact means including an electrical contact disposed on a lever arm, a rotatable attachment means for rotatably attaching said lever arm to said particle trapping means and a biasing means for biasing said contact means in a direction to make electrical contact with said corrugated outer conductor.

4,442,312
END PIECE OF BIPOLAR WATER-COOLED CABLE

Anatoly I. Oshkin, bulvar Koroleva, 10 kv. 58; Mikhail D. Banov, Ulitsa Belorusskaya, 25, kv. 30, and Alexandr N. Chernyshev, ulitsa Frunze, 20, kv. 56, all of Tolyatti, U.S.S.R.

PCT No. PCT/SU81/00009, 371 Date Sep. 2, 1982, 102(e) Date Sep. 2, 1982, PCT Pub. No. WO81/02617, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 28, 1981, Ser. No. 417,114
Int. Cl.[3] H01B *7/34*
U.S. Cl. 174—15 WF 3 Claims

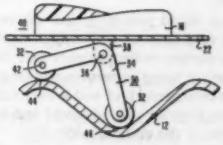


1. An end piece of a bipolar water-cooled cable comprising a cable cooling system means; a first part having sockets to connect current-carrying conductors of one polarity, an opening for connection to a cooling water source and communicating with spaces of said cable cooling system, and a recess; a second part rigidly secured to said first part; sealing insulation gasket means inserted between said first and second parts; an insert of said second part extending beyond a butt end of said second part and fitting through an insulation gasket in said recess of said first part, a portion of said insert extending beyond the butt end of said second part being cylindrical in shape and extending to a length not less than 2.5 diameters of the insert, said insert having a blind central hole for connecting the current-carrying conductors of the opposite polarity; and a sleeve made of an insulating material and rigidly secured on said insert and extending beyond an end of said insert.

4,442,313
CONDUCTOR LOAD BEARING ROLLER FOR A GAS-INSULATED TRANSMISSION LINE HAVING A CORRUGATED OUTER CONDUCTOR

William H. Fischer, and Kue H. Yoon, both of Pittsburgh, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 4, 1982, Ser. No. 439,247
Int. Cl.[3] H01B *9/06, 9/04;* H02G *5/06*
U.S. Cl. 174—28 3 Claims



1. A gas-insulated transmission line, comprising:
(A) a corrugated outer conductor;
(B) an inner conductor adapted for connection to an energizing source and disposed interiorly within said outer conductor;
(C) an insulating gas disposed within the annular space between said outer and inner conductors;
(D) insulating means disposed between said outer and inner conductors for insulatingly supporting said inner conductor within said outer conductor; and
(E) transport means for supporting and permitting axial movement without radial displacement of said inner conductor/insulating means assembly along said corrugated outer conductor, said transport means including two mov-

able support means supported on a common pivot lever, said pivot lever being rotatable about a pivot lever axis, said two movable support means being separated axially a distance equal to the axial distance between the peaks and valleys of the corrugations and separated radially a predetermined distance equal to the radial distance between the peaks and valleys of the corrugations.

4,442,314

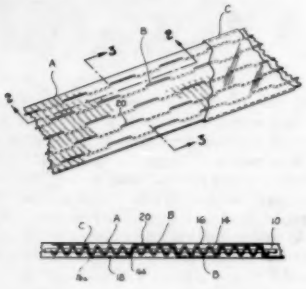
SHIELDED WOVEN CABLE ASSEMBLY AND METHOD OF MAKING SAME

Douglas E. Piper, Greenville, S.C., assignor to Woven Electronics Corporation, Mauldin, S.C.

Filed Aug. 18, 1982, Ser. No. 409,127

Int. Cl.³ H01B *7/08, 11/06*

U.S. Cl. 174—36 **8 Claims**



1. A continuously shielded woven electrical transmission cable assembly comprising:

a plurality of elongated warp elements extending in the warp direction in said woven cable;

a filling element interwoven with said warp elements to define a base weave pattern;

at least a number of said elongated warp elements being electrical signals conductor elements arranged in said weave pattern for transmitting electrical signals through said cable;

a plurality of uninsulated drain wires woven in the base weave pattern of said woven cable from one side of said woven cable to another side of said woven cable;

said drain wires being floated out of said base weave pattern at spaced picks of said filling element along the length of said cable;

a conductive shield jacketing said woven cable, said drain wires on each side of said woven cable contacting said shield on corresponding sides of said shield; and

said drain wires being woven in said base weave generally along the entire length of said woven cable for continuous immediate draining of said shield and termination of said drain wires at the ends of said cable.

6. A method of constructing a continuously shielded woven electrical transmission cable comprising the steps of:

weaving a plurality of warp elements with a filling element to define a base weave pattern;

including in said plurality of warp elements at least a number of electrical signal conductor elements;

weaving a plurality of drain wires in said cable generally from one side of the cable to the other side of said cable;

floating said drain wires out of said base weave patterns at spaced locations of said cable along the length thereof;

enclosing said woven cable in a metallic shield;

contacting said shield on both sides of said woven cable and said shield with floated said drain wires to effectively and instantaneously drain said shield on both sides of said shield along the length of said cable.

4,442,315

X-RAY TRANSMISSIVE ELECTRODE-SHIELDED WIRE ASSEMBLY AND MANUFACTURE THEREOF

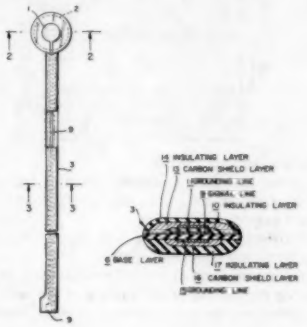
Kiyoshi Segawa, Tokyo, Japan, assignor to Fukuda Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 291,031

Claims priority, application Japan, Nov. 17, 1980, 55-160689; Nov. 17, 1980, 55-160690

Int. Cl.³ H01B *7/34;* **A61B** *5/04*

U.S. Cl. 174—36 **5 Claims**



1. A shielded wire used in conjunction with an electrode for application to a living body, said shielded wire being adapted to transmit electrical signals issuing from the living body, said shielded wire comprising an elongated strip of an insulating film, a narrow signal line formed on the surface of one side of said strip, a first layer of electrically conductive material having a width larger than the width of said signal line and arranged on said one side of said strip overlying said signal line, a layer of insulating material located between said signal line and said first layer of electrically conductive material, a second layer of electrically conductive material having a width larger than the width of said signal line and arranged on the opposite side of said strip underlying said signal line, and grounding lines electrically connected to and arranged longitudinally of said layers of electrically conductive material, said signal line being substantially shielded by said layers of electrically conductive material and said grounding lines.

4,442,316

CRIMP CONNECTOR FOR ELECTRICAL WIRES

Joerg H. W. Thuermer, Hamburg, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 3, 1981, Ser. No. 317,866

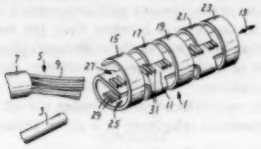
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043209

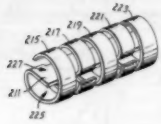
Int. Cl.³ H02G *15/08;* **H01R** *11/00*

U.S. Cl. 174—84 C **10 Claims**

1. A crimp connector for electrical wires for interconnecting at least one magnet wire and at least one connecting wire, comprising a unitary piece of sheet metal having a bridge part and a row of a plurality of fingers which depend from the bridge part radially of the axis of the connector, said fingers being bent circularly around the bridge part to form two chambers disposed side by side, one of said chambers being formed to accommodate a said magnet wire and the other chamber being formed to accommodate a said connecting wire, at least the magnet wire chamber having cutting means provided on its

interior surface for cutting through insulation on a said magnet wire upon compression of the chamber to make electrical





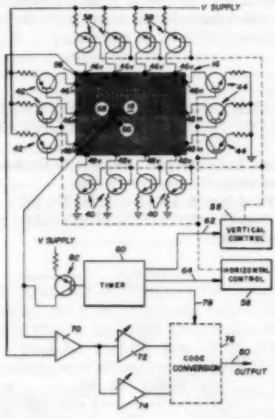
connection with the electrically conductive core of the magnet wire.

4,442,317

COORDINATE SENSING DEVICE

Louis H. M. Jandrell, Terra Linda, Calif., assignor to Sun-Flex Company, Inc., Novato, Calif.

Filed Sep. 14, 1981, Ser. No. 300,687
Int. Cl.³ G08C *21/00*
U.S. Cl. 178—18 **22 Claims**



1. A coordinate sensing device comprising:

a fine meshed fabric screen having electrical conductive properties and defining a major surface;

first current source means for selectively establishing a first electrical current between a first injection point and first sink point on said major surface, said first injection and sink points defining a first electrical field across the said major surface;

second current source means for selectively establishing a second electrical current between a second injectionand a second sink point on said major surface, said second injection point and sink points defining a second electric field across the said major surface, the two electric fields related so that the position of the equipotential lines from each field intersect at unique points;

probe means for selectively sensing a first electrical potential on the first electric field at a physical point on the surface between the first injection and sink points and a second electrical potential on the second electric field at the same physical point on the surface between the second injection and sink points;

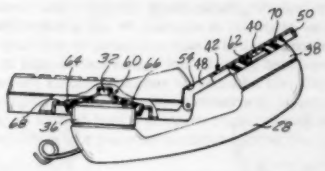
means for converting said sensed first or second potentials to an intelligent signal representing the coordinates of the physical point indicated in any chosen coordinate system.

4,442,318

PORTABLE BI-DIRECTIONAL DATA COMMUNICATION TERMINAL

Franklin J. Desrochers, 6230 Elro St., Davison, Mich. 48423

Filed Aug. 20, 1982, Ser. No. 409,779
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 C **4 Claims**



1. A portable terminal having bi-directional data communication capabilities via a telephone handset said terminal comprising:

a generally rectangular housing; a first acoustical coupler having a first muffler member with an opening therein defining a recess adapted to detachably receive a receiver portion of the telephone handset, said first muffler being mounted in said housing with the opening therein facing the bottom of the housing; a cover for the bottom of the housing; a second acoustical coupler having a second muffler member mounted on an inner surface of the cover, said second muffler member being of a configuration adapted to fit within the confines of the opening of the first muffler member; and hinge means for pivotally connecting one end of the cover to the housing, operative to enable flush mounting of the cover on the housing bottom with the second muffler member nested in the opening of the first muffler member in a closed position of the cover, and permitting the first and second muffler members to operably engage the receiver and transmitter portions of the telephone handset when the cover is in an open portion thereby enabling bi-directional data communication with the terminal.

4,442,319

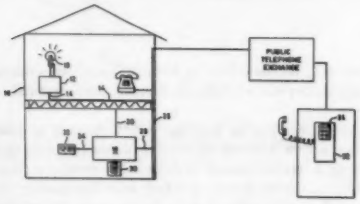
TELEPHONE ACCESSIBLE APPLIANCE CONTROL SYSTEM

Bernhard L. Treidl, 2 Soldiers Field Park, Apt. #501, Boston, Mass. 02163

Filed Feb. 26, 1981, Ser. No. 238,598
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 A **10 Claims**

1. Switching apparatus for time dependent switching of electric loads on a common three wire electrical distribution network comprising: tone decoder means for producing a predetermined coded signal corresponding to any series of unique tones out of a set of unique tones; local tone generation means connected to the tone decoder means for producing any series of unique tones out of a set of unique tones; telephone interface means adapted to be operatively coupled between a subscriber loop of a telephone network and said tone decoder means and being responsive to a predetermined number of ringing signals detected on said subscriber loop, whereby said tone decoder means will be connected to said subscriber loop and thereby receive any series of unique tones out of a set of

unique tones produced by remote tone generation means at a call originating telephone in said telephone network; a data structure in communication with said tone decoder means for storing a plurality of coded signals produced by said tone decoder means thereby forming one or more device control codes, each device control code including a device status code and an electrical load address identifying a particular addressable switching means and a set point time code for identifying a particular coded current time signal; clock means for producing a coded current time signal representative of a day and the time of day; at least one addressable switching means adapted to be connected to a three wire electrical distribution network for selectively engaging or isolating a respective electrical load from said three wire electrical distribution network in response to a predetermined load control signal, the addressable switching means including means for producing a load control feedback signal produced in response to said predetermined load control signal; control means connected to and responsive to signals produced by said clock means and adapted to communicate with said addressable switching means via said three wire electrical distribution network and in communication with said data structure whereby a load control signal is produced by said control means in response to a match between a



set point time of any device control code stored in said data structure and the current time signal, thereby engaging or isolating a respective electrical load from said three wire electrical distribution network, said control means including means responsive to said load control feedback signal whereby said control means manifests its response to said load control feedback signal by producing a unique audible tone; and the control means including means for modifying the status code in response to said load control feedback signal whereby said device status code is set to a first value when a load control feedback signal is received by said control means after a load control signal is produced by said control means, and is set to a second value when a load control feedback signal is not received by said control means after a load control signal is produced by said control means, and further comprising means for inputting into the control means electrical load addresses, whereby said control means will respond to an imputted electrical load address by producing a third unique audible tone when the device status code of the device control code associated with said electrical load address is equal to said first value, or by producing a fourth unique audible tone when the device status code of the device control code associated with said electrical load address is equal to said second value.

4,442,320

REMOTE SUBSCRIBER INTERACTION SYSTEM

Rolland T. James, Collingswood, and Ronald J. Chebra, Mercerville, both of N.J., assignors to Base Ten Systems, Inc., Trenton, N.J.

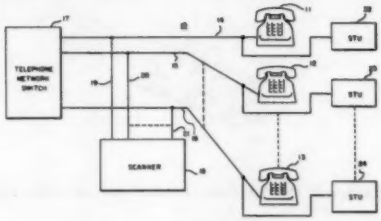
Filed Dec. 4, 1981, Ser. No. 327,486
Int. Cl.³ G08B *26/00*; H04M *11/04*
U.S. Cl. 179—5 R **13 Claims**

1. A system for providing communication between a central location and instrumentalities other than a conventional telephone located at the premises of telephone network subscribers, comprising:

means for selectively transmitting signals from the central location to the telephones at different ones of said subscriber premises;

means located at said premises and connected to said telephones and responsive to said transmitted signals to retransmit to the central location from the respective subscriber premises signals in the audible telephone frequency range and of characteristics indicative of the state of said instrumentalities;

means at the central location for sensing the off-hook state of the conventional telephone at a given subscriber's prem-



ises and responding thereto to inhibit the transmitting of said signals from the central location to that same premises;

means for transmitting to the central location a signal at a frequency below the audible range from each of the premises when the instrumentalities at the given subscriber premises are in one predetermined state; and

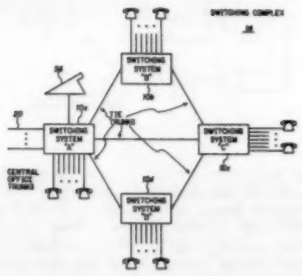
means responsive to at least one instrumentality being in another predetermined state to interrupt the transmission of said below-audible-range signal.

4,442,321

TRANSPARENT DIALING BETWEEN INTERCONNECTED TELECOMMUNICATION SWITCHING SYSTEMS

Carl J. Stehman, LaGrange, Ill., assignor to Rockwell International Corporation, Downers Grove, Ill.

Filed Jun. 8, 1981, Ser. No. 271,457
Int. Cl.³ H04M *7/00*; H04Q *3/54*
U.S. Cl. 179—18 EB **16 Claims**



14. A method of providing communications across multiple switching systems of a telecommunication switching complex, said method comprising the steps of:

interconnecting said switching systems with communication lines,

allocating to each system a custom group of directory numbers identifying stations serviced thereby,

correlating within each said system, the directory numbers corresponding to stations serviced by others of the systems with

quasi-ultimate system functions for selecting communica-

tion lines in accordance with dialed directory numbers, and

identity codes representative of communication lines connected to the switching systems servicing said stations; and

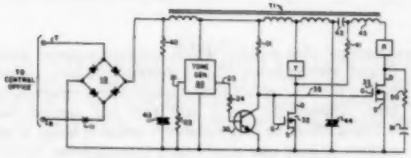
executing said quasi-ultimate system functions so that said dialed directory numbers are outpulsed over the communications lines correlated therewith.

4,442,322

ELECTRONIC COMMON SWITCH HAVING AN IMPROVED RECEIVER MATING ARRANGEMENT

Gary Grantland, Hartselle, Ala., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Jul. 7, 1982, Ser. No. 395,885
Int. Cl.³ H04M *1/26*
U.S. Cl. 179—81 R **5 Claims**



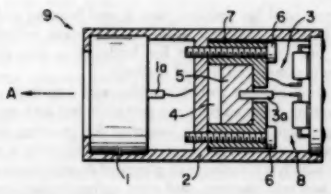
1. In a telephone substation, employing multi-frequency dialing, in combination, a speech network including a resistive path, a transmitter, a receiver and a signal generator, said signal generator arranged to produce a control signal and dialing signals to said speech network responsive to said signal generator being operated, a first transistor connected to said speech network arranged to turn on responsive to said control signal, a second transistor disconnecting said transmitter from said speech network responsive to said first transistor turning on, said second transistor further connected to said speech network via said resistive path, and a third transistor disconnecting said receiver from said speech network responsive to said first transistor turning on, said second transistor providing a bias voltage to said third transistor via said resistive path preventing said third transistor from being reverse biased by said dialing signals and reconnecting said receiver.

4,442,323

MICROPHONE WITH VIBRATION CANCELLATION

Satoshi Yoshida, and Hidejiro Higashi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 17, 1981, Ser. No. 284,023
Claims priority, application Japan, Jul. 19, 1980, 55-102295
Int. Cl.³ H04R *1/02*
U.S. Cl. 179—110 A **9 Claims**



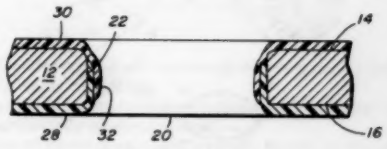
1. A microphone unit with vibration cancellation comprising: a microphone case; a capacitance type microphone element fixed to said case; a piezoelectric type vibration pickup unit fixed to said case; an inertial body, said vibration pickup unit being disposed between said inertial body and said case, a ratio of a stiffness of said vibration pickup unit to a mass of said inertial body being such that a vibration frequency response of said vibration pickup unit and said microphone are similar; and circuit means for combining outputs of said microphone element and said vibration pickup unit wherein a vibration component in said output of said microphone unit is cancelled by said output of said vibration pickup unit.

4,442,324

ENCAPSULATED BACKPLATE FOR ELECTRET TRANSDUCERS

Senior N. Blanchard, Spruce Head; William T. Flint, Owls Head; George C. Tibbetts, and Joseph A. Sawyer, both of Camden, all of Me., assignors to Tibbetts Industries, Inc., Camden, Me.

Filed Jun. 24, 1982, Ser. No. 391,966
Int. Cl.³ H04R *19/00*
U.S. Cl. 179—111 E **9 Claims**



1. A backplate assembly for an electret transducer comprising, in combination,

an electrically conductive sheet having a peripheral edge, front and back faces with an electrically conductive tab extending from said back face, and at least one acoustic aperture communicating between said faces, and

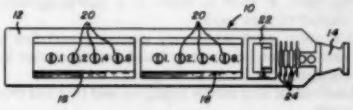
an electrically insulating coating of material substantially covering and bonded to both of said faces, said peripheral edge and the interior edge of each said aperture, said coating including a layer of electret material covering said front face.

4,442,325

SWITCHABLE INCREMENTAL ATTENUATION FOR TELEPHONE LINE INTERFACE

Noel C. McDermott, Santa Cruz, Calif., assignor to Larus Corporation, Santa Clara, Calif.

Continuation of Ser. No. 326,490, Dec. 2, 1981, abandoned. This application Sep. 2, 1983, Ser. No. 528,668
Int. Cl.³ H04M *1/76*
U.S. Cl. 179—190 **16 Claims**



1. A device for providing selectively incremental attenuation in a telephone circuit using discrete resistive values, comprising:

a plurality of serially coupled individually switchable attenuation sections, each of said attenuation sections including switching means for selectively determining the attenuation value of each section, permitting the selection of the total attenuation value of said device by integral multiples of a selected incremental base unit, within a range generally of 0–41.75 db;

frame including mounting means for receiving and supporting said attenuation device;

connecting means for connecting said serially coupled attenuator sections to said telephone circuit;

whereby incremental attenuation in said telephone circuit is provided.

4,442,326

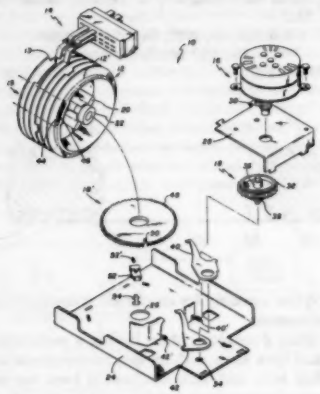
DRIVE MEANS FOR A TIMING MECHANISM

William F. Wagle, Bloomington, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 205,012, Nov. 7, 1980, abandoned. This application Jul. 14, 1982, Ser. No. 398,403

Int. Cl.³ H01H *43/10*

U.S. Cl. 200—38 R **4 Claims**



1. A timing mechanism comprising

(a) a cam means rotatably carried on a shaft and providing a program and electrical switches opening and closing in response to said program,

(b) rotatable first ratchet teeth of a first major diameter carried on said shaft and coupled to said cam means for intermittent rotation therewith,

(c) groups of rotatable second ratchet teeth coupled to and in axial alignment with said first rotatable ratchet teeth and of a second major diameter which is less than said first major diameter,

(d) rotatable third ratchet teeth carried by said shaft in axial alignment with said first and second ratchet teeth and independently rotatable from said first and second ratchet teeth and having a third major diameter which is greater than said second major diameter and further having a plurality of notches of sufficient depth to provide a minor diameter at least as small as a minor diameter of said second ratchet teeth,

(e) a drive pawl selectively engaging said first and third rotatable ratchet teeth and said second ratchet teeth when engaged with said notches, and

(f) individual stop means engaging said first and third ratchet teeth.

4,442,327

MANUALLY PORTABLE START CONTROL FOR ELECTRICALLY POWERED APPARATUS

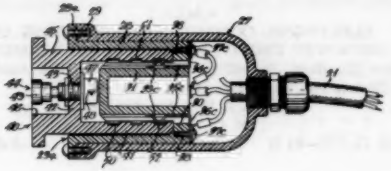
Frank L. West, Sharon, and Larry A. Norton, Elkhorn, both of Wis., assignors to Starline Products, Inc., Harvard, Ill.

Division of Ser. No. 140,202, Apr. 14, 1980, Pat. No. 4,349,856. This application Jun. 10, 1982, Ser. No. 386,940

Int. Cl.³ H01R *13/70*

U.S. Cl. 200—51 R **12 Claims**

1. A cordless manually portable start control mode for a system that controls energization of an electrically powered apparatus, said system having a primary control station remote from the apparatus, a secondary control station near the apparatus, and a cylindrical socket at each control station provided with first fixed contacts electrically connected to an electrical power source and second fixed contacts which are axially spaced from said first fixed contacts and which are electrically connected to the electrically powered apparatus so that an electrical circuit may be closed across said first and second fixed contacts at either control station to start energization of said apparatus, whereby said control stations are alternatively usable to control said energization, said



a cylindrical plug member which makes an endwise sliding fit and seats in either of said sockets, said plug member having first and second axially spaced start contacts which bear, respectively, upon said first and second fixed contacts when the plug member is seated in either of said sockets, at least one of said start contacts being annular, and a normally open push button start switch on said plug member, said start switch being adapted to be manually depressed to close an electric circuit through said start contacts at either station.

4,442,328

ELECTRICAL SWITCH

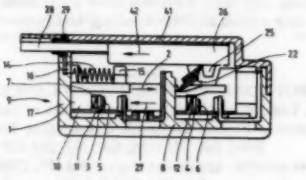
Alois Schäffeler, Spaichingen, Fed. Rep. of Germany, assignor to Marquardt GmbH, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,365

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1981, 3126816

Int. Cl.³ H01H *15/18, 21/40*

U.S. Cl. 200—76 **13 Claims**



1. An electrical switch comprising:

a housing;

a slide mounted for displacement in said housing and movable between two end positions, said slide including at least one contact bridge for bridging a pair of fixed contacts connected to said housing;

an operating plunger shiftable within said housing;

a snap spring engaged between said slide and said operating plunger, said snap spring mounted for pivoting on both said slide and said plunger and movable into a neutral plane which is transverse to planes of displacement of said slide and said plunger, said snap spring having two end positions in which said snap spring is inclined relative to said neutral plane and into which positions said snap spring is movable by shifting said operating plunger;

a tension spring connected between said slide and said housing for biasing said slide into one of its end positions in which said at least one contact bridge is out of engagement with said fixed contacts;

said housing includes a bottom, said plunger slidable parallel

to said bottom, said tension spring comprising a helical spring and provided in a space between said slide and said plunger;

a helical compression spring connected between said contact bridge and said slide for spring loading said contact bridge with engagement between said contact bridge and said fixed contacts, said contact bridge connected to said slide adjacent said housing bottom;

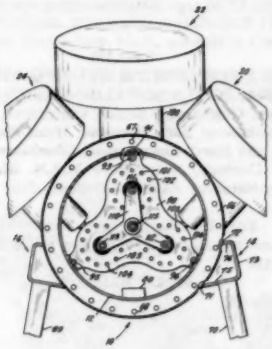
said housing including an upper part, said operating plunger mounted for shifting in said upper part, said operating plunger including a forked driver, said snap spring comprising a C-shaped snap spring having leg portions and a back connected between said leg portions, said snap spring back engaged in said forked driver, said snap spring including free end portions extending from said leg portions and toward each other, said slide including a groove shaped recess for receiving each end portion of said snap spring facing said upper part.

4,442,329

DEAD TANK HOUSING FOR HIGH VOLTAGE CIRCUIT BREAKER EMPLOYING PUFFER INTERRUPTERS

Keith I. Gray, La Verne, and Henry G. Meier, Glendale, both of Calif., assignors to Brown Boveri Electric Inc., Rolling Meadows, Ill.

Filed Jan. 4, 1982, Ser. No. 336,636
Int. Cl.³ H01H *33/60*
U.S. Cl. 200—148 B **10 Claims**



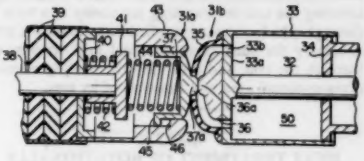
1. A dead tank high voltage circuit breaker comprising, in combination: a gas-filled cylindrical elongated metal housing having an exterior support framework; first, second and third elongated interrupter structures disposed parallel to one another and having respective central axes which are equally spaced from one another; three pairs of insulator bushings, each of said three pairs connected to the opposite ends of respective ones of said first, second and third interrupter structures; each of said pairs of bushings extending outwardly of said metal housing to provide exterior connection points for each of said interrupter structures; an operating mechanism disposed exteriorly of said elongated metal housing and having operating shaft means connected to each of said interrupter structures for simultaneously operating each of said interrupter structures; a generally triangularly shaped flat support plate for supporting said first, second and third interrupter structures in cantilever within said housing; one end of each of said interrupter structures being fixed to said support plate with the axes of said interrupter structures perpendicular to the plane of said plate; and first, second and third relatively thin straps having one of their ends fixed to respective apices of said triangularly shaped plate and their opposite ends fixed to said metal housing; said first, second and third straps being more flexible than said plate.

4,442,330

PUFFER TYPE CURRENT INTERRUPTER

Youichi Oshita, Kashiwa; Shunji Sato, Hitachi; Takeshi Takahashi, Hitachiota, and Kunio Hirasawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,820
Claims priority, application Japan, Aug. 12, 1981, 56-125236
Int. Cl.³ H01H *33/70*
U.S. Cl. 200—148 A **14 Claims**



1. A puffer type current interrupter including current interrupting means comprising:

a pair of electrodes having confronting surfaces formed in a substantially symmetric shape;

a pair of bosses respectively integrally formed on the confronting surfaces of said electrodes and adapted to provide electrical contact between said electrodes, said bosses having substantially equal heights with respect to the respective confronting surfaces;

an insulator nozzle means for covering one of said pair of electrodes and having a throat which is capable of receiving the boss of the other of said pair of electrodes;

a gas flow path formed between said insulator nozzle means and said one of said pair of electrodes; and

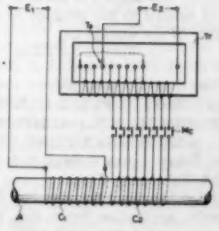
means responsive to an opening operation of said electrodes for compressing arc-quenching gas and blasting the compressed gas through said gas flow path to extinguish an arc produced betweeen said bosses when said electrodes are opened.

4,442,331

METHOD AND APPARATUS OF INDUCTION HEATING A METALLIC ELONGATED MATERIAL HAVING DIFFERENT THICKNESS SECTIONS

Yasuo Watanabe, Kita-Kyushu, Japan, assignor to Dai Ichi High Frequency Company, Ltd., Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,088
Claims priority, application Japan, Jan. 22, 1981, 56-8220
Int. Cl.³ H05B *6/06, 6/40*
U.S. Cl. 219—10.43 **14 Claims**



1. In a method of inductively heating elongated metallic material in which the elongated metallic material is passed axially through the coils of an induction heater in a continuous motion at a uniform speed and in which the axial dimension of the induction heater is small relative to the axial dimension of the metallic material, the improvement by which the uniform

heating of the metallic material over the length thereof is achieved despite significant variations in the cross-sectional area of the metallic material over the length thereof, comprising the steps of:

(a) providing a coil with multiple axially spaced turns; and

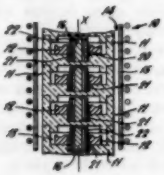
(b) selectively applying an electric current to the individual turns of the coil in synchronism with the passage of the metallic material therethrough

to thereby selectively vary the ratio which (i) the time each successive cross-sectional area of the metallic material entering the coil is in heating proximity to a turn thereof through which current is applied bears to (ii) the total time necessary for such cross-sectional area to pass entirely through the coil, and thus vary the heating of each such cross-sectional area as a function of its area.

4,442,332
HEAT TREATMENT OF ROTATIONALLY SYMMETRICAL WORKPIECES BY INDUCTION HEATING

William B. Jackson, Wirral; Ian G. Harvey, Upton by Chester, and Philip H. Warren, Chester, all of England, assignors to The Electricity Council, England

Filed Jul. 13, 1981, Ser. No. 282,901
Int. Cl.³ H05B *6/10*
U.S. Cl. 219—10.67 **27 Claims**



1. A method of heat treating a rotationally symmetrical workpiece by induction heating comprising mounting the workpiece on a refractory transport means and passing the transport means longitudinally through an elongate treatment region of an induction heating apparatus with the axis of symmetry of the workpiece parallel to the magnetic flux of the induction heating apparatus, the workpiece being accompanied on at least part of its passage through the treatment region by at least one flux modifying member to modify the magnetic flux distribution in the workpiece wherein said flux modifying member is arranged so that, by the effects of the eddy currents induced in that member and/or its magnetic permeability, the resultant distribution across the workpiece transversely to the axis thereof of the flux density in the axial direction is substantially inversely related to the distance from the axis of rotational symmetry of the workpiece.

4,442,333
CAPACITOR-TYPE PULSE GENERATOR FOR ELECTRICAL DISCHARGE MACHINING, ESPECIALLY FOR WIRE-CUTTING EDM

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Feb. 25, 1981, Ser. No. 238,123
Claims priority, application Japan, Feb. 26, 1980, 55-23574
Int. Cl.³ B23P *1/08*
U.S. Cl. 219—69 W **3 Claims**

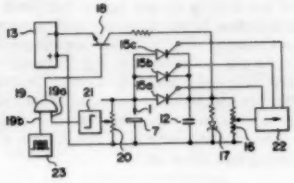
1. A capacitor-type pulse generator for wire-cutting EDM, comprising:

a capacitor;

a DC source having an output voltage for charging said capacitor;

first switch means connected in series with said capacitor, a wire electrode and a workpiece, said wire electrode and said workpiece defining an EDM gap therebetween;

a first sensing circuit responsive to the charging voltage on said capacitor for turning said first switch means into conduction upon said charging voltage reaching a predetermined level, thereby permitting the charge on said capacitor to be discharged through said EDM gap whereby to form at least one EDM pulse;



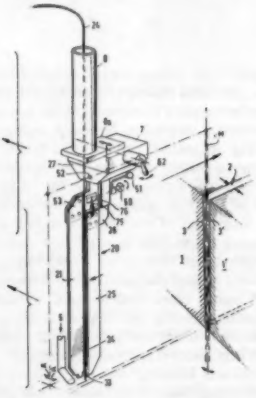
second switch means connected in series with said DC source and said capacitor and normally held conductive to permit said capacitor to be charged by said DC source to said predetermined level, said output voltage of said DC source being at least twice said predetermined charging level; and

a second sensing circuit responsive to the EDM gap voltage for turning said second switch means into nonconduction upon the EDM gap voltage exceeding a preselected value.

4,442,334
DEVICE FOR FEEDING WELDING WIRE IN A SUBMERGED ARC WELDING OPERATION

Werner Lux, Oberhausen; Jürgen Vahlensieck, Bonn; Jakob Zell, Oberhausen; Bodo Hermann; Heinz Bartsch, both of Bottrop, and Horst Zimmermann, Oberhausen, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 334,072
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049118
Int. Cl.³ B23K *9/18*
U.S. Cl. 219—73 **20 Claims**



1. A device for feeding welding wire in a welding advance direction in a welding operation in which there is a narrow gap between welding workpieces which are to be welded together, comprising: a guide support; a plurality of spaced apart wire straightening roller assemblies mounted on said guide support,

said straightening roller assemblies being positioned at separated location and at selected angles around the circumference and in engagement with the welding wire and defining a feed guide path for the passage of a welding wire, said welding wire straightening roller assemblies comprise at least three separate units arranged in spaced relationship along the feed guide path, each unit being positioned at a desired angle around the periphery of the welding wire with respect to an adjacent unit, each of said units comprising a shell which is centered and fixed with respect to a shell of an adjacent unit, at least two straightening rollers rotatably mounted to said shell on one side of the feed guide path and at least one other straightening roller rotatably mounted to said shell on an opposite side of the feed path for straightening the welding wire therebetween; a carrying member mounted for pivotal motion on said guide support; a welding head mounted on said carrying member including a current-carrying guide and a welding wire guide arranged in spaced opposition and defining tongs of said head; means on said carrying member for mounting said current-carrying guide and said welding wire guide for movement toward and away from each other; a plurality of guide shoes associated with said tongs defining a continuing guide for the welding wire aligned with the feed guide path and receiving wire from the feed guide path and advancing it to the welding zone between the workpieces; a contact piece associated with said current carrying guide for delivering welding current to the wire at a welding zone; and means for biasing said current-carrying guide toward said welding wire guide.

4,442,335

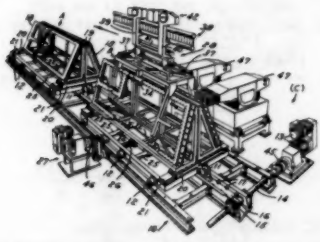
SIDE APERTURE WELDING ASSEMBLY SYSTEM

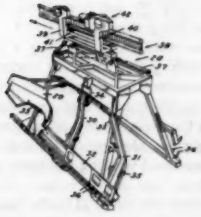
Cristiano Rossi, Birmingham, Mich., assignor to Comau S.p.A., Turin, Italy

Continuation of Ser. No. 363,897, Mar. 31, 1982, abandoned. This application Jun. 7, 1982, Ser. No. 385,514

Int. Cl.³ B23K *9/12, 37/00*

U.S. Cl. 219—79 **11 Claims**





1. A multiple style vehicle body side aperture welding system characterized by overhead carrier means including laterally spaced side aperture support means for respectively carrying a plurality of components of left and right side apertures to be welded together in integrated relation, a framing station including alternatively positionable floor mounted fixture means for each body style extending inside between the left and right side aperture support means of said carrier means upon entering said station, means for effecting relative closing movement between said support means and said fixture means at said framing station, said fixture means having tooling for accurately locating and clamping said side aperture components for the particular body style at said station relative to each other and said station upon closing of said support means and fixture means, and selectively programmable welding means at said station for integrally joining said components in accurate relation while held by said fixture means.

4,442,336

APPARATUS FOR CONDUCTING SMUT-FREE STUD WELDING

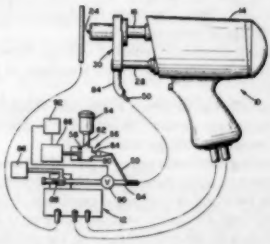
Thomas E. Shoup, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 75,751, Sep. 14, 1979. This application Oct. 9, 1981, Ser. No. 310,142

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.³ B23K *9/20*

U.S. Cl. 219—98 **30 Claims**

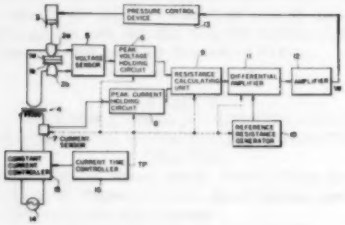


1. Apparatus for welding a stud to a workpiece with the weld area around the stud being maintained substantially free of contaminant coatings, said apparatus comprising a welding tool having means for holding the stud, means for establishing a welding arc between the stud and the workpiece, and means for moving the stud toward and away from the workpiece, a spark shield assembly including an outer spark shield having end notches, an inner non-metallic sleeve in said shield, fluid supply passage means formed between said sleeve and said spark shield, said sleeve having a plurality of passages at an end of said sleeve toward the notched end of said spark shield, said passages being directed inwardly toward the weld area around the stud, a welding foot supporting an end portion of said spark shield opposite the notched end in a position around said holding means with an inner surface of said sleeve being spaced from said holding means, a source of gas under pressure communicating through said welding foot with said supply passage means for supplying gas through said sleeve passages during a welding operation, and a source of anti-smut liquid under pressure communicating through said welding foot with said supply passage means for supplying liquid through said sleeve passages during the welding operation.

4,442,337
METHOD AND SYSTEM FOR DUAL CONTROL OF RESISTANCE WELDING

Shuji Nakata, Toyonaka; Yoshio Kawaguchi, Yokohama, and Akira Nishimura, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Apr. 21, 1981, Ser. No. 256,244
Claims priority, application Japan, Apr. 21, 1980, 55-51684; Jan. 30, 1981, 56-11627
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—117.1 41 Claims



1. A method of dually controlling resistance welding, which compriese the steps of:

(a) detecting electrode resistance between welding electrodes between which members to be welded are pinched;

(b) comparing the detected electrode resistance with a reference electrode resistance based on a predetermined reference electrode resistance curve;

(c) controlling the electrode pressure applied to the welding electrodes in accordance with the difference in electrode resistance between the detected value and the reference value so that the detected electrode resistance coincides with the reference electrode resistance based on the reference electrode resistance curve;

(d) detecting electrode welding voltage between the welding electrodes between which members to be welded are pinched;

(e) comparing the detected electrode voltage with a reference electrode voltage based on a predetermined reference electrode voltage curve; and,

(f) controlling electrode current passed between the welding electrodes in accordance with the difference in electrode voltage between the detected electrode voltage value and the reference electrode voltage value so that the detected electrode voltage coincides with the reference electrode voltage based on the reference electrode voltage curve,

whereby the electrode current is controlled by detecting the electrode voltage, in addition to the control of the electrode pressure by detecting the electrode resistance.

4,442,338
PLASMA ETCHING APPARATUS

Takashi Yamazaki, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

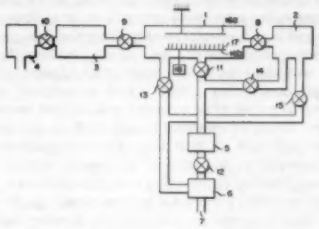
Filed Aug. 26, 1981, Ser. No. 296,305
Claims priority, application Japan, Sep. 3, 1980, 55-121007
Int. Cl.³ B23K *9/00*; C23F *1/02*
U.S. Cl. 219—121 PE 4 Claims

1. A plasma etching process comprising:

etching by exposing a workpiece containing aluminum or aluminum alloy in its surface to plasma of a reactive gas introduced into a space between a pair of parallel flat plate electrodes disposed in an etching chamber, said plasma being formed by applying high frequency power to one of said flat plate electrodes, said reactive gas containing chlorine atoms and the other electrode being grounded;

transporting the workpiece from said etching chamber into an after-treatment chamber; and

blowing a gas heated to 40° to 200° C. introduced through a conduit against the workpiece in the after-treatment

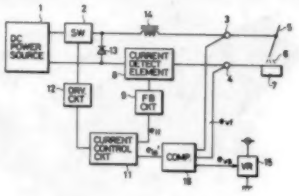


chamber so as to remove chlorine remaining on the workpiece surface.

4,442,339
CONSTANT VOLTAGE DC ARC WELDING APPARATUS

Takaji Mizuno; Hiroshi Suwahara, and Hirohisa Segawa, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,774
Claims priority, application Japan, Jul. 31, 1981, 56-120217
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—130.33 7 Claims



1. A DC welding apparatus comprising:

(a) a DC power source (**1**) for supplying current between a welding electrode (**5**) and a material (**7**) to be welded through a switching element (**2**);

(b) a comparator (**16**) for comparing a voltage detected across said welding electrode and material to be welded with a predetermined set voltage, to provide a first difference signal therebetween; said comparator comprising circuit means for delaying the difference signal;

(c) a current detecting element (**8**) for detecting the current flowing between said welding electrode and said material to be welded;

(d) a current control circuit (**11**) for subjecting a signal proportional to the detected current and the delayed difference signal from said comparator, which corresponds to a predetermined set current, to comparison to derive a control signal; and

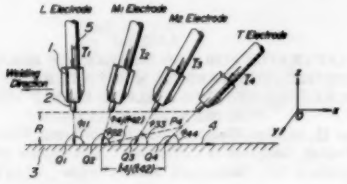
(e) a drive circuit (**12**) for said switching element, said drive circuit being responsive to said control signal to control the on-off operation of said switching element to maintain a constant arc voltage and reduce the number of welding sputters.

4,442,340

FOUR-ELECTRODE SUBMERGED ARC WELDING PROCESS

Fumimaru Kawabata; Atsushi Shiga, both of Chiba, and Tadamasa Yamaguchi, Yotsukaido, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Oct. 14, 1982, Ser. No. 434,379
Claims priority, application Japan, Oct. 20, 1981, 56-166387
Int. Cl.³ B23K 9/18
U.S. Cl. 219—137 PS 5 Claims



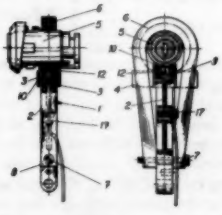
1. A four-electrode submerged arc welding process with four electrodes L, M_1, M_2 and T aligned in one row from front to rear in a welding direction, all said electrodes being supplied with alternating current, comprising connecting said electrodes such that electromagnetic force F_{X4} in a direction opposite to said welding direction acting upon a middle point of an arc from said rearmost T electrode is substantially within $-25 \leq F_{X4} \leq -10$ (N/m).

4,442,341

ELECTRIC ANTIFREEZE HEATING DEVICE FOR LOCK CYLINDERS AND MOUNTING ARRANGEMENT THEREFOR

Yvan Lesquereux, and Pierre-Andre Lesquereux, both of 2, rte. de Duillier, Nyon, CH - 1260, Switzerland

Filed Jul. 15, 1982, Ser. No. 398,754
Claims priority, application Switzerland, Jul. 20, 1981, 4728/81
Int. Cl.³ E05B 17/00; H05B 3/02
U.S. Cl. 219—201 4 Claims



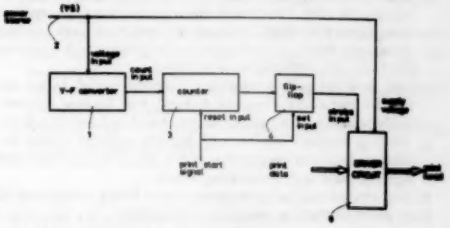
1. An antifreeze device for locking cylinders for vehicle and house door locks comprising at least one PTC resistor, a non-conducting pressure body, said pressure body including two transverse wing pairs, said wing pairs forming two guide grooves, an elastic tension means, said elastic tension means adapted to surround a lock cylinder and be hooked in a detachable manner to the pressure body and engaged in said guide grooves, said tension means adapted to push a bearing side of the pressure body, in heat exchange relationship with said at least one PTC resistor within said body, against the lock cylinder, the bearing side of the pressure body being defined by a recess sealed by a U-shaped bent sheet metal strip that comes to rest against the lock cylinder, said recess lodging said at least one PTC resistor, said pressure body including a terminal plug connected with one of the conductors of said at least one PTC resistor and the other conductor of said at least one PTC resistor being in contact with the sheet metal strip, so that the circuit to said at least one PTC resistor is completed by engagement of said metal strip with the lock cylinder.

4,442,342

THERMAL PRINTER WITH PRINT DENSITY CONTROL

Shigeo Yoneda, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 30, 1982, Ser. No. 373,681
Claims priority, application Japan, May 1, 1981, 56-67140
Int. Cl.³ H05B 3/00
U.S. Cl. 219—216 4 Claims



1. A thermal printer comprising:

a print head for effecting printing upon supply of voltage thereto;

voltage-to-frequency converter means responsive to the voltage supplied to said print head for producing an output signal whose frequency varies as a function of the supply voltage to said print head; and

control circuit means for permitting voltage supply to said print head for a period determined by a predetermined number of pulses of the frequency of the output signal of said voltage-to-frequency converter to thereby control the current conduction duration of said print head as a function of the variation in the supply voltage to said print head,

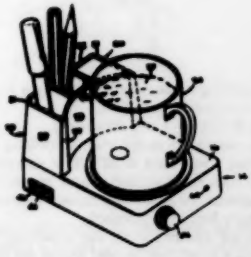
whereby the strength of thermal energy supplied to said print head is kept constant regardless of variations in the supply voltage to said print head.

4,442,343

ADJUSTABLE CUP AND FLUID HEATER

James E. Genuit, Carrollton, and Gary Cooper, Lewisville, both of Tex., assignors to Koffee Keeper, Inc., Lewisville, Tex.

Filed Apr. 16, 1982, Ser. No. 369,101
Int. Cl.³ F27D 11/02
U.S. Cl. 219—433 1 Claim



1. A heater for cups and fluids therein, comprising:

a. adjustable heating circuitry means, said adjustable heating circuitry comprising a heating element and a solid-state controlled switch, AC power supply, temperature sensor; adjustable temperature control and circuit and combined

limiter, DC power supply, detector, sensing amplifier and gate and protection integrated circuitry in operative circuit therewith,

b. a base support,

c. a heating plate, said heating plate being disposed above said heating element and being comprised of heat-conductive material,

d. circuit-enclosing housing means, said circuit-enclosing housing means being supported by said base support and comprising a substantially horizontal surface defining an opening for mounting said heating plate therein and vertically-extending receptacle means, said vertically-extending receptacle means comprising a floor and front, rear and a pair of opposed side walls defining an open topped receptacle said front wall facing said heating element being concave about at least a portion of said heating plate, said floor being disposed at a level which is above the level of said horizontal surface,

f. said base support comprising a recess raised in an upwardly extending direction toward, and located substantially beneath, said heating element and said heating plate,

g. heating support means, said heating support means extending between said recess, said heating element and said heating plate and comprising a bolt,

h. said circuit-enclosing housing means being comprised of an electrically non-conductive material,

i. said solid-state controlled switch and said adjustable temperature control each being accessably located on an exposed portion of said circuit-enclosing housing means,

j. a sealed well, said sealed well being located in said heating plate,

k. said temperature sensor being located in said sealed well in thermal communication with a cup placed on said heating plate.

4,442,344

SENSOR CONTROLLED COOKING APPARATUS

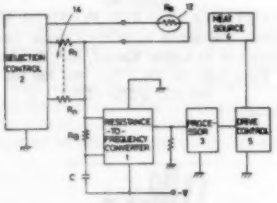
Takatoshi Yasuda, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 21, 1981, Ser. No. 285,506

Claims priority, application Japan, Jul. 28, 1980, 55-107178[U]

Int. Cl.³ H05B 1/02

U.S. Cl. 219—497 **12 Claims**



1. A cooking apparatus for cooking a foodstuff to a desired doneness comprising:

means for heating said foodstuff;

sensor means for monitoring a cooking condition and producing a variation in an output resistance value thereof;

means responsive to said sensor means for converting said resistance value of said sensor means into a sensor frequency indicative thereof;

means for compensating for variations in said sensor frequency produced by said means for converting by using the lowest sensor frequency monitored by said means for compensating to modify said sensor frequency to produce a compensated frequency signal substantially free of tolerance induced variations in the resistance of said sensor means;

reference means for developing a reference frequency signal representative of the desired doneness corresponding to a user selected menu;

control means for disabling said means for heating to terminate the cooking of said foodstuff upon coincidence of said compensated frequency signal developed from said means for compensating and said reference frequency signal developed by said reference means.

4,442,345

APPARATUS FOR AND METHOD OF RECYCLING RECORDING CARRIERS, SUCH AS CREDIT CARDS, INCLUDING NON-VOLATILE ERASABLE MEMORIES FOR IDENTIFICATION DATA

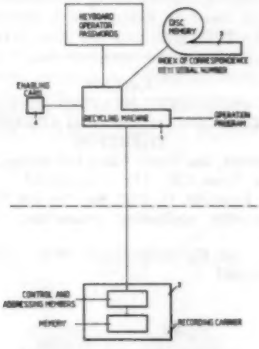
Jean H. Mollier, Bougival, and Michel Ugon, Plaisir, both of France, assignors to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme), Paris, France

Continuation of Ser. No. 340,523, Dec. 2, 1981, which is a continuation of Ser. No. 143,808, Apr. 23, 1980, abandoned. This application Jul. 29, 1983, Ser. No. 517,981

Claims priority, application France, Apr. 25, 1979, 79 10561

Int. Cl.³ G06K 5/00

U.S. Cl. 235—380 **9 Claims**



1. A method of changing variable data stored in a credit card memory having first and second zones, the first zone including: a first fixed serial number bit field, a card validating/invalidating character field subject to change to an invalidating state, and initially having a state different from the invalidating state, and a key character field containing data unknown to the person carrying the card, the key character controlling change of data stored in the second zone, the data in the second zone being subject to change to enable re-use of the credit card, the method comprising reading each of said fields, comparing the second field with a predetermined value for the second field, in response to the comparing step indicating that the second read field is an invalid character preventing change of the data in the second zone to data associated with re-use of the credit card, comparing the serial number read from the first field with a set of serial numbers for credit cards, comparing the key character with a predetermined value therefor correlated with the card serial number, in response to the second field comparing step indicating that the second read field is not an invalid character and in response the first field comparing step indicating that the read serial number is in the set of assigned serial numbers and in response to the third field comparing step indicating that the key character has the predetermined value therefor changing the data in the second zone to data associated with re-use of the card.

4,442,346

MONEY DEPOSIT AND/OR DISPENSING DEVICE

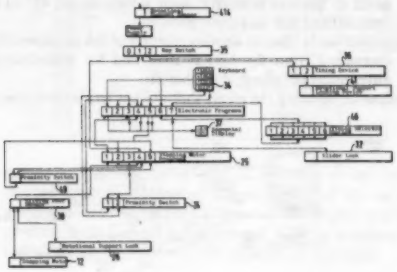
Gerhard Bösinger, Schulstr. 9, D-8857 Wertingen; Michael Backes, Herrenberg 14, D-8851 Buttenwiesen, and Eberhard F. Beyhl, Unterrieden Nr. 73, D-8503 Altdorf, all of Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,507

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3022066

Int. Cl.³ G06F *15/30*

U.S. Cl. 235—379 9 Claims



1. A device for deposit and/or dispensing of money having a plurality of bank note reception compartments in a housing, an opening and as associated closure member being provided in said housing for allowing access to one of said compartments when said closure member is in an open position, and means for moving said compartments within said housing to bring said compartments in registration with said opening, comprising control means for controlling said closure member after each closure thereof to enable said opening position independently of the movement of said compartments only a predetermined delay time after an opening instruction is introduced into said control means through an instruction input generator.

4,442,347

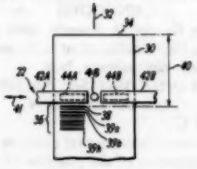
INDICIA READING METHOD AND APPARATUS

Kenneth A. Hams, Easton, Pa., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed Aug. 31, 1981, Ser. No. 297,534

Int. Cl.³ G06K *7/016*

U.S. Cl. 235—474 23 Claims



1. A method of reading indicia on documents travelling past a read station, said documents having thereon a number of print lines, said method comprising the steps of:

detecting the presence of a document in said read station;

determining when an indicia-bearing portion of said travelling document is in a position to be read, said determination further comprising the steps of:

generating a digital signal having a pulse frequency proportional to the speed of travel of said document;

counting with a first counter means the number of said pulses as an indication of the number of printing lines that are passing through the read station;

maintaining a second counter means in a selective present condition until said second counter means is enabled to count, said second counter means having a maximum value to which it can count so that its range of counting from a preset count to a maximum count is controllable;

comparing the counted number of said pulses counted by said first counter means to a pre-selected value, said pre-selected value approximating the number of print lines typically distancing a neighborhood of the indicia-bearing portions of similar documents from an edge of similar documents; and,

enabling said second counter means to count further ones of said pulses when it is determined that the number of pulses counted by said first counter means equals said preselected value, said counting by said second counter means commencing from said preset count;

scanning a number of further consecutive print lines on said document for an initial information mark signaling the beginning of said indicia, the number of print lines so scanned being related to the counting range of said second counter means; and,

reading at least one further print line of said indicia-bearing portion of said document.

4,442,348

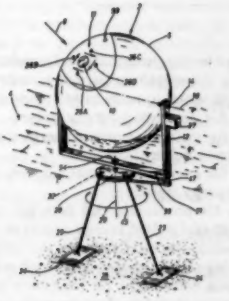
SOLAR TRACKING APPARATUS FOR A GIMBALED BODY

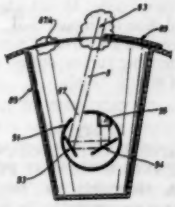
Wesley L. Snyder, 1103 Forest Home Dr., Houston, Tex. 77094

Continuation of Ser. No. 73,128, Sep. 6, 1979, abandoned, which is a continuation of Ser. No. 880,882, Mar. 16, 1978, Pat. No. 4,276,122. This application Aug. 13, 1981, Ser. No. 292,607

Int. Cl.³ G01J *1/24*

U.S. Cl. 250—203 R 17 Claims





1. A solar tracking apparatus for detecting incident solar radiation and providing a means for orienting a gimbaled body relative to said solar radiation, said tracking apparatus being insensitive to movements of said gimbaled body caused by environmental factors, comprising:

a plurality of independent light receiving sensors capable of individual sensitivity adjustment, located on said gimbaled body;

means operatively associated with and electrically connected to said plurality of sensors, for moving said gimbaled body about perpendicular axes relative to the position of said solar radiation; and,

sensitizing means for controlling the amount of radiation needed to activate any of said sensors, thus inhibiting said means for moving said body in unfavorable environmental conditions;

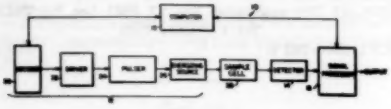
said sensitizing means including for each of said plurality of independent light receiving sensors, a coarse radiation adjustment means and a fine radiation adjustment means for correcting for overshoot of the solar radiation, said coarse adjustment means including a rotating drum having an aperture therein, said drum housing one of said plurality of independent light receiving sensors, said coarse adjustment means further including reflective optics for dispersion of the solar radiation to facilitate detection by said light receiving sensor.

4,442,349

CIRCUITRY FOR THE GENERATION AND SYNCHRONOUS DETECTION OF OPTICAL PULSED SIGNALS

Sture R. Blom, Wayland, and Theodore M. Osborne, Burlington, both of Mass., assignors to Baird Corporation, Bedford, Mass.

Filed Sep. 15, 1980, Ser. No. 187,518
Int. Cl.³ G01J *3/00*
U.S. Cl. 250—222.1 **3 Claims**



1. Circuitry for the generation and synchronous detection of pulsed signals in a spectrometer, said circuitry being characterized by a high signal to noise ratio comprising:

(a) means for generating current pulses;

(b) means for generating pulsed energy signals in response to said current pulses;

(c) means for generating detector signals in response to said pulsed energy signals;

(d) means for processing said detector signals in synchronism with said pulsed energy signals including an integrator, a switch synchronized with said pulsed energy signals for driving said integrator and a high pass filter to remove extraneous noise in the 1/f frequency spectrum from said detector signals before they are integrated by said integrator;

(e) a second switch coupled to said integrator for dumping said integrated detector signals; and

(f) means for generating a series of signals for driving said means for generating current pulses, said series of signals being variable analog signals.

4,442,350

FIBER OPTIC SENSOR WITH ENHANCED IMMUNITY TO RANDOM ENVIRONMENTAL PERTURBATIONS

Scott C. Rashleigh, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 17, 1981, Ser. No. 293,589
Int. Cl.³ G01B *11/16*
U.S. Cl. 250—227 **18 Claims**

11. A sensor for sensing a field condition with minimum disturbance from environmentally induced perturbations comprising:

a sensing region defined by a length of single mode birefringent optical fiber made birefringent to have two orthogonally disposed eigenmodes oriented respectively along fast and slow axes, said optical fiber being disposed on a carrier;

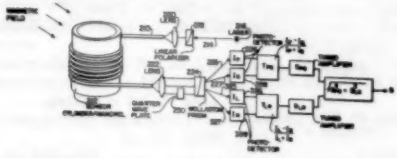
means for launching linear polarized light into one end of the optical fiber at 45° to its fast and slow axes for propagation therethrough along its length and emanating at the other end;

said carrier adapted to undergo dimensional changes in response to the field condition to strain the birefringent fiber relative to its axes for changing the birefringence thereof;

means for splitting one portion of the light emanating from the optical fiber other end into first and second components of linearly polarized light which are at 45° to the optical fiber fast and slow axes;

a quarter wave plate in another portion of the polarized light emanating from the optical fiber end for introducing a differential 90° phase shift therein;

means for splitting the phase shifted light into a third component of left circularly polarized light and a fourth component of right circularly polarized light;



means for monitoring the intensities of the first and second linearly polarized light components to produce first and second electrical signals respectively and for combining the first and second electrical signals to filter out low frequency perturbations to provide a third electrical signal proportional to stresses in the optical fiber induced by the field condition;

means for monitoring the intensities of the third and fourth circularly polarized light components to produce fourth and fifth electrical signals respectively and for combining the fourth and fifth electrical signals to filter out low frequency perturbations to provide a stress induced sixth electrical signal which is phase shifted by 90° relative to the third electrical signal;

means for combining the third and sixth electrical signals to produce an output electrical signal which is independent of low frequency environmentally induced perturbations.

4,442,351

OPTOELECTRONIC INCREMENTAL POSITION ENCODER

George F. Pfeifer; George R. Koonce, both of Liverpool, and Jack E. Phillips, Fayetteville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,219
Int. Cl.³ H01J *3/14*
U.S. Cl. 250—237 G **14 Claims**

1. An optoelectronic incremental position encoder for providing a signal indicative of the position of an encoder slide, comprising:

an optical interrupter assembly, including a plurality of paths for optical wavelength radiation to pass therethrough, and a plurality of photodetectors, each photodetector being situated to receive said radiation in a separate one of said paths of optical wavelength radiation, respectively;

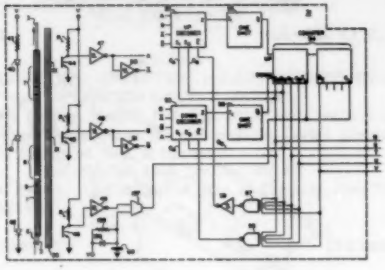
an encoder slide positioned for linear movement with respect to said interrupter, said slide having optically transmissive windows arranged in tandem and colinear with the line of movement of said slide so that in response to said movement said photodetectors can detect said radiation transmitted through said windows;

a digital counter;

means coupled to selected ones of said photodetectors for

providing electronic output signals and logic complement signals thereof; and

decoder means coupled to receive said electronic signals and logic complements thereof from selected ones of said photodetectors, said decoder means being coupled at its



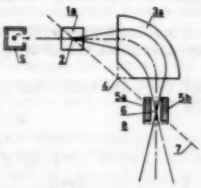
output to said counter so that in response to the count thereof said decoder means can select one of the signals applied thereto and supply a signal to said digital counter to cause said counter to count and thereby produce an output signal indicative of the position of said slide.

4,442,352

SCANNING SYSTEM FOR CHARGED AND NEUTRAL PARTICLE BEAMS

Anders Brahme, Bromma, Sweden, assignor to Instrument AB Scanditronix, Sweden

Continuation-in-part of Ser. No. 150,447, May 16, 1980, abandoned. This application Mar. 9, 1982, Ser. No. 356,284
Claims priority, application Sweden, May 17, 1979, 7904360
Int. Cl.³ H01S *1/00*; G01K *1/08*
U.S. Cl. 250—251 **12 Claims**



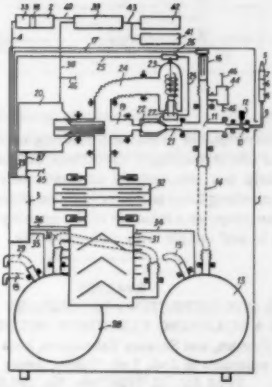
1. A method of irradiating a confined volume of material normally located at a substantial depth below a surface with a beam of high energy particles, comprising the steps of electromagnetically scanning the beam in a first plane such that the scanned particles emanate from a first center of divergence; forming an image of the first center of divergence of the scanned beam by electromagnetically bending the beam through a spatial angle; and electromagnetically scanning the electromagnetically bent beam in a second plane perpendicular to the first plane with the so-scanned particles emanating from a second center of divergence, and with the second center of divergence being disposed so as to generally coincide with the image of the first center of divergence.

4,442,353

HIGH-PRECISION METHOD AND APPARATUS FOR IN-SITU CONTINUOUS MEASUREMENT OF CONCENTRATIONS OF GASES AND VOLATILE PRODUCTS

Jean-Claude C. Baubron, Sandillon, France, assignor to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Jun. 19, 1981, Ser. No. 275,164
Claims priority, application France, Jun. 20, 1980, 80 13776
Int. Cl.³ B01D *59/44*
U.S. Cl. 250—281 **6 Claims**



2. Apparatus for high precision measuring of concentrations of gases and volatile products emanating from any natural or industrial source at a varying flow-rate and at a varying pressure above atmospheric pressure before being fed to a mass spectrometer via an input duct and an intermediary expansion enclosure while maintaining optimal pressure values within said spectrometer and said expansion enclosure by means of vacuum pumps, and collecting over a very long period of time samples of the gases in which time-dependent variations of concentrations are to be measured; said apparatus comprising:

(a) a sampling probe (**5**) for collecting gas samples,

(b) an expansion enclosure (**11**)

(c) a pressure-independent duct (**9**) connecting said probe to said expansion enclosure (**11**)

(d) a pressure-limiting valve (**12**) between said duct and said enclosure (**11**),

(e) a vacuum pump (**13**) for evacuating said expansion enclosure (**11**),

(f) a pressure gauge (**16**) measuring the pressure in said expansion enclosure for controlling the operation of said valve (**12**) as a function of said pressure,

(g) a mass spectrometer (**20**) having an analysing chamber (**19**),

(h) a piezo-electric valve (**22**) between said expansion enclosure (**11**) and the analysing chamber (**19**) of said mass spectrometer (**20**), for controlling the gas flow from said enclosure (**11**) into said analysing chamber, and

(i) means for controlling said piezo-electric valve (**22**) as a function of the pressure in said analysing chamber.

4,442,354

SPUTTER INITIATED RESONANCE IONIZATION SPECTROMETRY

G. Samuel Hurst; James E. Parks, and Harold W. Schmitt, all of Oak Ridge, Tenn., assignors to Atom Sciences, Inc., Oak Ridge, Tenn.

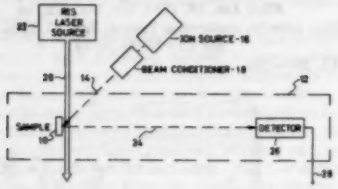
Filed Jan. 22, 1982, Ser. No. 341,895
Int. Cl.³ B01D *59/44*
U.S. Cl. 250—281 **32 Claims**

1. A method of quantitatively analyzing for a component in

a sample, said method having sufficient sensitivity to determine as little as one atom, which comprises:

bombarding said sample with energetic particles thereby producing a cloud of constituents of said sample;

subjecting said cloud to laser initiated resonance ionization



spectroscopy for selectively ionizing constituents in said cloud corresponding to said component; and

accurately and substantially simultaneously detecting said ions resulting from said laser initiated resonance ionization spectroscopy as a measure of the quantity of said component in said sample with said sensitivity.

4,442,355

DEVICE FOR DETECTING SECONDARY ELECTRONS IN A SCANNING ELECTRON MICROSCOPE

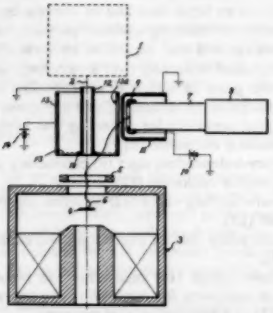
Nobuaki Tamura, and Susumu Takashima, both of Akishimashi, Japan, assignors to Jeol, Ltd., Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 286,056

Claims priority, application Japan, Jul. 31, 1980, 55-105516

Int. Cl.³ H01J *37/26*

U.S. Cl. 250—310 **6 Claims**



1. In a device for detecting secondary electrons enamating from a specimen in a scanning electron microscope in which a primary electron beam emitted along an optical axis from an electron gun is directed onto said specimen placed substantially centrally in a gap between the magnetic pole pieces of an objective lens, said device comprising a scintillator with an accelerating electrode and a photomultipler that are located in a position displaced off the objective lens toward the electron gun, the improvement comprising a first pipe-shaped electrode disposed around the optical axis for preventing deflection of the primary electron beam due to the accelerating electrode associated with the scintillator, an annular-shaped mesh electrode supported from the first pipe electrode extending outwardly from the first pipe-shaped electrode and away from the optical axis, a second pipe-shaped electrode around the first supporting the peripheral edge of the mesh electrode, said mesh electrode maintained at a positive potential such that the mesh electrode and second pipe-shaped electrode guide the secondary electrons to the scintillator.

4,442,356

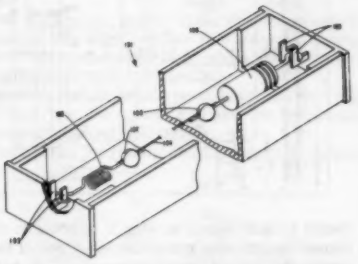
CORONA WIRE ASSEMBLY AND METHOD

Sandra L. Ludwick, Broomfield; Stanley L. Pond, Boulder County, and Robert T. Rhodes, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1981, Ser. No. 294,945

Int. Cl.³ H01T *19/04*

U.S. Cl. 250—324 **2 Claims**



1. In a copier, a corona emission wire assembly comprising the combination of:

a conductive and high strength emission wire;

a supporting structure, having arms, for mechanically retaining the wire under tension and electrically connecting the wire to an external circuit;

a tension spring connectable between one end of the wire and an arm of the structure;

a resistor connectable between another end of the wire and another arm of the structure; and

first and second deformable connectors, each connector having a slot for concurrently receiving one end of the wire and a lead from one of said spring or resistor, for mechanically and electrically joining them when the connector is deformed to compress them in the slot, the first connector joining one end of the wire and a lead of the tension spring, and the second connector joining the opposite end of the wire and a lead of the resistor.

4,442,357

DIFFERENTIAL RADIATION DETECTION APPARATUS

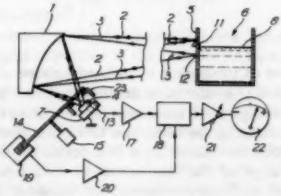
Geoffrey Baker, and Roger A. Lockett, both of Southampton, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1981, Ser. No. 304,290

Claims priority, application United Kingdom, Sep. 26, 1980, 8031083

Int. Cl.³ G01J *1/00*; G01F *23/00*

U.S. Cl. 250—338 **9 Claims**



1. A differential radiation detection apparatus comprising an objective for forming a real image of a field of view in an image plane in response to thermal radiation emitted by objects in said field of view, a pair of thermal radiation detectors adjacent

to one another in said image plane, a radiation chopper located between said objective and said detectors and substantially in said image plane, said chopper having blades which chop the real image radiation falling on both detectors at a predetermined chopping frequency, and circuit means for extracting a.c. output signals at the chopping frequency of each of said detectors and including means for deriving a signal determined by the difference between said a.c. output signals.

4,442,358

APPARATUS FOR DETECTING α-RAYS PRESENT IN A SPECIFIED ENERGY RANGE

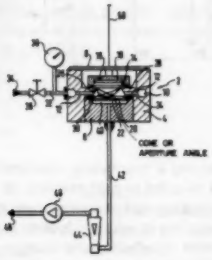
Hans-Jürg Kreiner, Munich, Fed. Rep. of Germany, assignor to Münchener Apparatebau für elektronische Geräte Kimmel GmbH, Haar, Fed. Rep. of Germany

Filed Nov. 18, 1980, Ser. No. 208,321

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1979, 2947302

Int. Cl.³ G01J *1/16*

U.S. Cl. 250—435 **21 Claims**



1. An α-ray detection apparatus including an energy discriminating α-ray detector having a receiving surface for measuring the energy of α-particles suspended in a gas which are separated from the gas on the receiving surface of a membrane filter, comprising:

a cylindrical body enclosing a chamber within which said detector and said filter are disposed;

an annular flange extending from said cylindrical body radially inward with respect to the axis of said body, said flange having first and second surfaces perpendicular to said axis and a circumferential inner surface tapered toward said second surface, said filter receiving surface being sealed against said first surface and said detector receiving surface being sealed against said second surface whereby a measuring space is formed defined by said receiving surfaces and said circumferential inner surface;

pressure reduction means for reducing the pressure of said measuring space to less than atmospheric pressure to reduce energy loss by said α-particles while in said measuring space; and

admitting means for admitting said gas suspended α-particles into said measuring space through said annular flange.

4,442,359

MULTIPLE FIELD-OF-VIEW OPTICAL SYSTEM

David B. Lederer, Rochester, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.

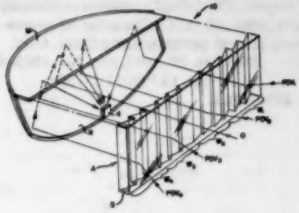
Filed Mar. 1, 1982, Ser. No. 353,364

Int. Cl.³ G01J *1/04*

U.S. Cl. 250—342 **9 Claims**

1. For use in an electromagnetic radiation-responsive detection system of the type comprising a radiation-responsive detector disposed on an optical axis, an optical system for concentrating radiation onto the detector from each of a plurality of discrete fields of view, said optical system comprising:

an array of optical wedges, each wedge being adapted to intercept radiation propagating toward said optical axis at a unique angle and to refract such radiation in a direction substantially parallel to said optical axis and toward said detector; and



a reflective focusing element disposed on said optical axis between said optical wedge array and said detector to focus radiation refracted by each of said wedges onto said detector.

4,442,360

RADIATION DETECTOR

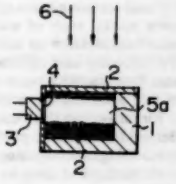
Atsushi Suzuki, Higashiyamato; Hiromichi Yamada, Hino; Yoko Uchida, Kawasaki; Hideki Kohno, Tokyo; Fukino Tadashi, Hachioji, and Minoru Yoshida, Tokyo, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,426

Claims priority, application Japan, Apr. 25, 1980, 55-54156

Int. Cl.³ G01T *1/20*; G01J *1/58*

U.S. Cl. 250—486.1 **13 Claims**



1. A radiation detector comprising a scintillator exhibiting luminescence by the action of radioactive rays and a light detector detecting light output of said scintillator, characterized in that said scintillator is a phosphor represented by the formula:

$$(A_{1-x-y}Ln_xCe_y)_2O_2S:X \quad (I)$$

wherein A is at least one element selected from the group consisting of Y, La and Gd; Ln is Pr; and X is at least one element selected from the group consisting of F, Cl and Br; and the values of x and y and the amount of X are as follows:

$0.000003 \leqq x \leqq 0.2$,

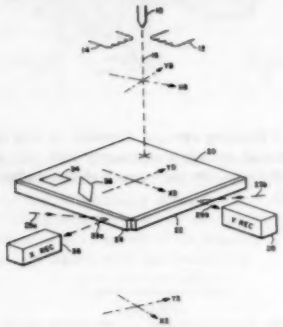
$0.000001 \leqq y \leqq 0.005$, and

X=0 to 1000 ppm on weight basis.

4,442,361
SYSTEM AND METHOD FOR CALIBRATING ELECTRON BEAM SYSTEMS

John Zasio, Sunnyvale; Larry Cooke, Cupertino, and Raymond Paul, Soquel, all of Calif., assignors to Storage Technology Partners (through STC Computer Research Corporation, managing general partner), Santa Clara, Calif.

Filed Sep. 30, 1982, Ser. No. 429,948
Int. Cl.³ H01J *37/304*
U.S. Cl. 250—491.1 **17 Claims**



1. A calibration system for making a plurality of scanning beam systems compatible one with another, each of said scanning beam systems including bean deflection control means for controlling the deflection of a scanning beam in response to beam deflection signals, and stage position control means for controlling the movement of a stage in response to stage position signals, said stage being selectively positioned in the path of said scanning beam, and said stage further being adapted to receive and hold an object that is to be scanned, whereby a desired pattern can be scanned on said object by said beam through selective control of said beam deflection and stage position signals, said calibration system comprising:

marking means for marking a calibration plate held on the stage of a first of said scanning beam systems with a plurality of calibration marks, each of said mark being positioned at a prescribed location on said calibration plate;

holding means for allowing said calibration plate to be removed from said first scanning beam system and inserted into another of said scanning beam systems;

measuring means for measuring the location of a plurality of said marks after said calibration plate has been inserted into said other scanning beam system;

mapping means for creating and using an error data map that indicates the difference between the prescribed location and the measured location; and

correction means, responsive to said error data map, for selectively controlling the movement of the stage of said other scanning beam system so that a pattern exposed on an object placed thereon is aligned with a pattern scanned on said same object whenever said object is placed on the stage of said first system.

4,442,362
SHORT PULSE GENERATOR

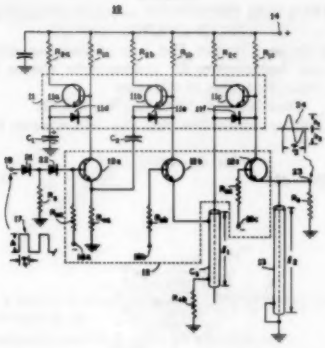
Basrur R. Rao, Lexington, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed May 17, 1982, Ser. No. 378,558
Int. Cl.³ H03K *3/00*
U.S. Cl. 307—108 **7 Claims**

1. An appartus for generating signals of short duration comprising:

charging means having a conducting state and a nonconducting state for supplying energy at an output means thereof while in said conducting state and including a plurality of unidirectional current conductive devices poled to set said charging means to said nonconducting state when said energy supplied achieves a predetermined level;

a plurality of chargeable energy storage devices coupled to said unidirectionl current conductive devices and said charging means such that all are charged from said charging means substantially simultaneously to achieve said predetermined energy level;



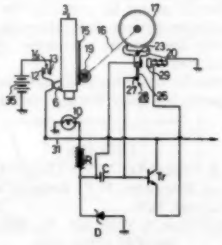
switch means having a conducting state and a nonconducting state, and coupled to said plurality of energy storage devices for coupling said energy storage devices substantially in series when in said conducting state; and

pulse shaper means coupled to said energy storage devices by said switch means during said conduction state of said switch means for providing an energy discharge path for energy stored in said storage devices and for providing an output signal representative of said energy discharge from said energy storage devices.

4,442,363
TIMER SWITCH FOR VEHICLE

Masaru Suzuki, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Niwa, Japan

Filed Jan. 7, 1983, Ser. No. 456,431
Claims priority, application Japan, Jan. 19, 1982, 57-6495; Feb. 1, 1982, 57-14549
Int. Cl.³ H01H *3/34, 43/00*
U.S. Cl. 307—141.4 **14 Claims**



1. A timer switch to be installed in a vehicle, comprising:

a casing;

a setting member for setting a desired period, which is housed in said casing and is moved along its axis when a desired period is set;

a switching means which is turned on when a desired period is set by said setting member;

a biasing means for biasing said setting member to its original position;

an escape wheel provided with saw-shaped teeth in the outer periphery thereof, which is rotatably supported within said casing;

a clutch means which is interposed between said setting member and said escape wheel for disengaging said setting member from said escape wheel while said setting member is operated and engaging said setting member with said escape wheel when said escape wheel turns to return said setting member to its original position;

an anchor provided with a pair of claws, which is rockably supported within said casing so as to be opposed to said escape wheel; and

an anchor rocking means for rocking said anchor at constant periods to engage said pair of claws with said teeth of said escape wheel alternately;

said anchor rocking means being provided with a magnetic body fixed to said anchor, an electromagnetic member disposed within said casing so as to be opposed to said magnetic body, and an electric current supplying means for supplying an electric current to said electromagnetic member intermittently.

4,442,364

OVERHEAD ELECTRIC TRANSMISSION SYSTEMS

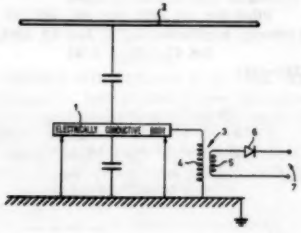
Philip Dey, New Barnet, England, assignor to BICC Public Limited Company, London, England

Filed Jul. 19, 1982, Ser. No. 399,914

Claims priority, application United Kingdom, Jul. 21, 1981, 8122471

Int. Cl.³ H02G 7/20

U.S. Cl. 307—147 **8 Claims**



1. An overhead electric transmission and optical communication system of the kind in which at least one overhead electric conductor, along which an alternating current is caused to flow, is freely supported in long lengths between spaced towers and in which the overhead electric conductor, or at least one of the overhead electric conductors, includes at least one optical guide of the optical communication system, wherein, at at least one tower along the system, electrical power for electrically powered ancillary equipment of the optical communication system is derived from at least one electrically conductive body supported by and electrically insulated with respect to the tower and electrically connected to earth through the primary winding of a step-down voltage transformer, the electrically conductive surface area of the or each electrically conductive body and its position with respect to a current carrying overhead conductor of the transmission system being such that said electrical power is provided across the secondary winding of the transformer.

4,442,365

HIGH SPEED LATCH CIRCUIT

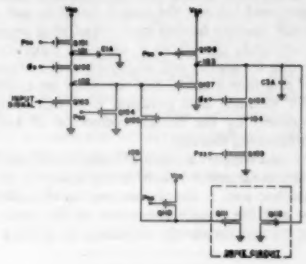
Akira Nagami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,925

Claims priority, application Japan, Dec. 2, 1980, 55-170071

Int. Cl.³ H03K 3/356

U.S. Cl. 307—279 **11 Claims**



5. A latch circuit comprising first to fourth nodes, means for supplying said first node with a logic signal, first charging means for operatively charging a second node at said first potential, second charging means for operatively charging said fourth node at said first potential, means for operatively discharging a potential at said third node to a second potential, first control means for operatively enabling said first and second charging means and said discharging means during a first period, first transfer means for operatively transferring a potential at said second node to said third node, second control means for operatively enabling said first transfer means during a second period after said first period, switching means responsive to a level of said first node for selectively discharging a potential of said second node to a second potential, and second transfer means responsive to a potential at said third node for selectively providing an electrical path between said first and fourth nodes.

4,442,366

SWITCH-PLUG MODULE FOR PORTABLE ELECTRIC TOOL

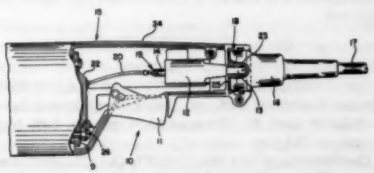
Giuseppe Cuneo, Gattorna, Italy, assignor to Black & Decker Inc., Newark, Del.

Filed Mar. 2, 1982, Ser. No. 353,918

Claims priority, application Italy, Mar. 4, 1981, 20969/81[U]

Int. Cl.³ H02K 7/14

U.S. Cl. 310—50 **4 Claims**



1. A portable electric tool, comprising:

a tool housing having a handle depending rearwardly therefrom with a receptacle recessed in the rear of the handle for receiving a female connector of a cord set therein, said receptacle being separated from the interior of the handle by a partition;

an electric motor contained in said tool housing and having a cable, comprising the leads of the motor, extending

rearwardly therefrom and terminating in a female connector;

an elongate support structure having a lug at the forward end thereof and being attached to said motor by a screw passing through said lug into the rear end of the motor;

a trigger-actuated switch having a trigger and a switch housing, the switch housing being mounted at the rear end of said support structure, and the trigger being mounted on said support structure intermediate the length thereof between said lug and the switch housing; and

said switch housing having two sets of plug prongs extending outwardly therefrom in opposite directions, one set extending forwardly and engaging in the female connector of said motor cable, and the other set extending rearwardly through said partition into said receptacle for engagement by the female connector of said cord set when received therein;

whereby said support structure, trigger and switch housing form a sub-assembly which during assembly of the portable electric tool is simply secured to the motor by said screw and the female connector of the motor cable inserted on said forwardly extending set of plug prongs.

4,442,367

ELASTOMERIC MEMBER FOR SUSPENDING A MOTOR WHILE POSITIONING ITS MAGNET

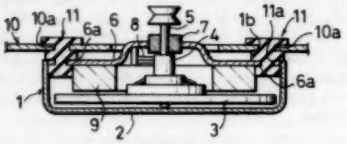
Tadashi Suzuki, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,324

Claims priority, application Japan, Aug. 6, 1981, 56-117271[U]

Int. Cl.³ H02K 5/24

U.S. Cl. 310—91 **1 Claim**



1. A member for suspending a motor from a chassis of a tape recorder or the like, comprising a support member formed of elastomeric material and having a first constricted portion of a reduced diameter adapted to fit tightly within an opening of said chassis and a second constricted portion of a reduced diameter adapted to fit tightly within an opening of a frame member supporting said motor, said member including means formed by an enlarged portion adapted to abut the lateral side surface of a permanent magnet of said motor for aligning the permanent magnet of said motor by positioning a plurality of said members in spaced relation around the lateral side surface thereof.

4,442,368

ROTATING ELECTRICAL MACHINE

Stefan Kupisiewicz, 55, rue Bois d'Evegnee, and Jacques J. F. Schoebrechts, 61, Chaussee de Wegimont, both of 4634 Soumagne, Belgium

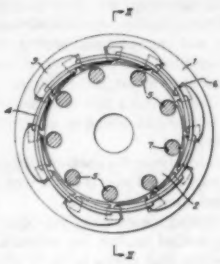
Continuation of Ser. No. 199,357, Oct. 21, 1980, abandoned. This application Mar. 21, 1983, Ser. No. 477,587

Claims priority, application Belgium, Apr. 25, 1980, 2/58536; Sep. 30, 1980, 2/58779

Int. Cl.³ H02K 3/04

U.S. Cl. 310—201 **16 Claims**

1. A rotating electrical machine of the type comprising a stationary portion and a moving portion coaxial therewith, said stationary portion including a first and a second winding, and said moving portion including a single phase third winding, said first and second windings having pole pitches even multiples or sub-multiples of each other and a mutual zero inductance, said third winding being alone and closed on itself, the arrangement being such that said first winding generates a field inducing current into said third winding, said current generating a fixed flux in relative rotation with respect to said moving



portion which has the same pole pitch as said second winding and magnetically interacts with said second winding, said third winding including a number of bar sets each of which comprise two interconnected bars, said number of bar sets being equal to the number of pole pairs of said first or second winding having the largest pole pitch.

4,442,369

ROTOR OF A SUPERCONDUCTIVE ROTARY ELECTRIC MACHINE

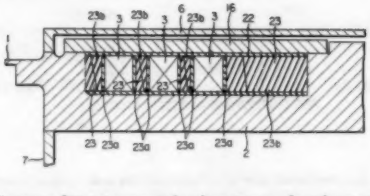
Kouichi Okamoto, Kobe; Masaki Sakuyama, Ashiya, and Mitsuo Tanaka, Ibaragi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1982, Ser. No. 388,733

Claims priority, application Japan, Jun. 22, 1981, 56-98890

Int. Cl.³ H02K 3/48

U.S. Cl. 310—214 **1 Claim**



1. A rotor for a superconductive rotary electric machine, comprising:

a coil carrying shaft;

a plurality of superconductive magnetic field coil means mounted on said coil carrying shaft and having coil end portions which are curved along the circumference of an end portion of the coil carrying shaft, said coil end portions being spaced in the direction of the length of said shaft to define gaps between the coil end portions;

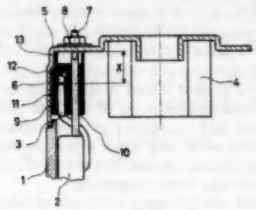
electrically insulating padding plate means positioned against the side surfaces of said coil end portions on opposite sides of said gaps; and

electrically insulating filler means filling the remainder of said gaps between said padding plate means, said filler means being a pair of filler portions which have a cross-sectional shape of complementary wedges and filling the space in each gap between the padding plate means.

4,442,370
BRUSH LEAD RETAINER FOR AN ELECTRICAL MACHINE

Gerard Veyssiere, Issoire, France, assignor to Ducellier & Cie, France

Filed Sep. 2, 1981, Ser. No. 298,780
Claims priority, application France, Oct. 23, 1980, 80 22645
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—239 **1 Claim**

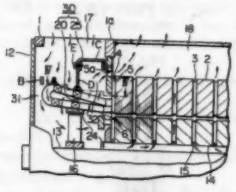


1. A device for immobilizing the brush lead connections of electrical machines, particularly for motor vehicle starters, which includes a housing, inductor windings held against said housing, connections formed between said windings, an end support on which is mounted a brush carrying assembly of which at least one of the brushes includes a flexible brush lead of substantial length, the starter assembly being held together by means of tie rods situated near to the brush lead and to one of said connections, the device being characterized in that it is constituted by a retainer disposed, when assembled, so as to cooperate with the brush lead, tie rod and connection between windings and being adapted to be held in position by gripping between the interior of the end support and said connection, by virtue of a resiliently deformable lip integrally formed at the bottom of a groove extending inwardly from one end of the retainer parallel to a longitudinal hole through which passes the tie rod, and also of an annular resiliently deformable ip surrounding the external periphery of the other end of the retainer.

4,442,371
COOLING DEVICE FOR ROTARY ELECTRIC MACHINE

Yumiteru Utsunomiya, Isahaya, and Shigeru Murayama, Nagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1982, Ser. No. 436,652
Claims priority, application Japan, Nov. 24, 1981, 56-188589
Int. Cl.³ H02K *3/46*
U.S. Cl. 310—260 **4 Claims**

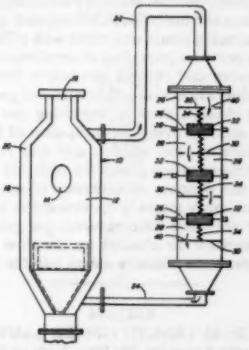


1. In a cooling device for a rotary electric machine wherein a coil end portion of a stator of said rotary electric machine is provided with a ventilating guide which divides the stator coil end portion in the axial direction into a first ventilating section extending in the radial direction that causes cooling air to advance onto an inner peripheral side of the coil end portion and a second ventilating section extending in the radial direction that causes the cooling air, having passed through said first ventilating section, to advance onto an outer peripheral side of the coil end portion, and which guides the cooling air, having passed through said second ventilating section, into a space surrounding the stator, the improvement in said ventilation guide comprising a shroud covering the stator coil end portion from the outer peripheral side, and a partition member disposed on an inner peripheral side of said shroud and extending radially inwardly to divide a ventilation space into which said stator coil end portion extends into said first and second ventilation sections, said partition member being constructed of an electrically-insulating spacer ring of hardened, felt-like material interposed while pliable and hardened in position so as to extend in a circumferential direction between top coils and bottom coils of said stator coil end portion, and individual electrically-insulating spacers of hardened, felt-like material respectively interposed while pliable and hardened in position between the top coils and between the bottom coils in a manner to adjoin said spacer ring, said spacer ring and adjoining individual spacers closing up the interspaces between coils and forming said partition.

4,442,372
PIEZO ELECTRIC APPARATUS FOR GENERATING ELECTRICITY

Walter M. Roberts, Buffalo, N.Y., assignor to Walton Energy Systems Co., Buffalo, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,229
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—339 **6 Claims**



1. In a frequency generator, a furnace chamber in which heat is produced, a refrigerant chamber at least partially surrounding the furnace chamber, a liquid refrigerant in the refrigerant chamber that is vaporized by the heat produced in the furnace chamber, a condensing chammber, conduit means connecting the refrigerant chamber with the condensing chamber whereby vaporized refrigerant under pressure flows from the refrigerant chamber to the condensing chamber and after passing through the latter returns to the refrigerant chamber, a plurality of piezo electric elements in the condensing chamber in the path of the pressurized refrigerant passing therethrough, and means in the condensing chamber for producing variations in the refrigerant pressure whereby the refrigerant exerts a mechanical force on the piezo electric elements which in turn produce electricity, said last-named means comprising an apertured plate member located between each adjacent pair of piezo electric elements.

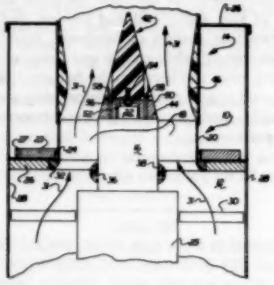
4,442,373
APPARATUS FOR REDUCING AERODYNAMIC DRAG IN SYSTEM FOR AIR COOLING A HIGH POWER VACUUM TUBE

Robert E. Klein, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 22,945, Mar. 22, 1979, abandoned. This application Sep. 2, 1981, Ser. No. 298,737

Int. Cl.³ H01J *7/26, 61/52*

U.S. Cl. 313—35 **13 Claims**



1. Apparatus for use in conjunction with a high power vacuum tube including a body portion having a longitudinal axis, a plurality of heat radiating members each extending transversely outward from said body portion in a direction transverse to said longitudinal axis, channel means for defining a channel through which gas may flow in a longitudinal direction past said body portion and said heat radiating members so as to cool said body portion, and entry and exit ports for directing gas flow into and out of said channel, said apparatus comprising drag reducing means associated with at least one of said entry and exit ports for providing an aerodynamically smooth transition between said channel and said at least one port to minimize gas drag associated with the flow of gas between said port and said channel, thereby improving gas flow through said channel, and improving the dissipation of heat from said high power vacuum tube, wherein said drag reducing means comprising chimney means associated with said exit port from said channel and defining an extension of said gas channel, wherein said chimney means is constructed of a material having sufficient resilience that reduced gas pressure created within the extension air channel by the flow of gas therethrough will draw the chimney means into the desired shape.

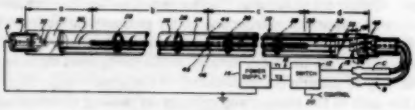
4,442,374
DUAL LENGTH COPIER LAMP

Merle E. Morris; Lawrence M. Rice, both of Lexington, and Steven L. Meade, Winchester, all of Ky., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 25, 1982, Ser. No. 362,016

Int. Cl.³ H01K *9/00, 1/18*

U.S. Cl. 313—316 **18 Claims**



1. In an incandescent lamp including a tubular quartz envelope, a coiled tungsten filament substantially centrally disposed within said envelope and extending substantially the length thereof, and first and second contact means located respectively at first and second opposing ends of said coiled tungsten filament and electrically coupled thereto, said coiled tungsten filament being energized over the substantially entire length thereof when a predetermined, first voltage is applied across said first and second contact means, the improvement comprising:

means for de-energizing an end portion of preselected length of said coiled tungsten filament while enabling the remaining length of said filament to be energized, said de-energizing means comprising a third contact means located at said second opposing end of said coiled tungsten filament and spaced from said second contact means, said third contact means electrically coupled to said coiled tungsten filament at a point located an established distance from said second opposing end substantially equal to said preselected length of said coiled tungsten filament being de-energized, said de-energizing of said end portion of said filament and said energizing of said remaining length simultaneously occurring when a predetermined, second voltage is applied across said first and third contact means.

14. An incandescent lamp comprising:

first and second tubular quartz envelopes of substantially the same length and positioned substantially parallel to each other, each of said envelopes having a first sealed end portion positioned within a first common mount member and a second sealed end portion positioned within a second common mount member;

a first coiled tungsten filament having a first length and substantially centrally disposed within said first tubular quartz envelope;

a second coiled tungsten filament having a second length shorter than said first length and substantially centrally disposed within said second tubular quartz envelope;

first contact means associated with said first common mount member and electrically coupled to a first end of each of said first and second coiled tungsten filaments;

second and third contact means associated with said second common mount member and respectively electrically coupled to a second end of said first and second coiled tungsten filaments whereby said first coiled tungsten filament will be energized when a predetermined, first voltage is applied across said first and third contact means and said second coiled tungsten filament will be energized when a predetermined, second voltage is applied across said first and second contact means.

4,442,375
ELECTRICAL SELF-PURIFICATION IGNITION PLUG

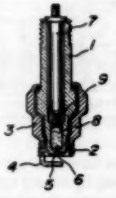
Kanemitsu Nishio, Komaki; Shunichi Takagi, Tajimi, and Yasuhiko Suzuki, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Aug. 11, 1980, Ser. No. 176,800

Claims priority, application Japan, Sep. 14, 1979, 54-117208; Sep. 14, 1979, 54-117209

Int. Cl.³ H01T *13/20*

U.S. Cl. 313—142 **6 Claims**



2. An electrical self-purification ignition plug comprising a porcelain insulator ignition leg provided with a conical depression at its end surface opposed to a grounded electrode, and a center electrode exposed to the base surface of said conical depression and made integral with said porcelain insulator, said

center electrode being composed of a metal chip formed of a metal selected from the group consisting of Ni, Ni base alloy and Au-Pd alloy and made integral with said porcelain insulator by hot pressing at a softening temperature of said metal chip.

4,442,376

COLOR DISPLAY TUBE HAVING HEAVY METAL COATING ON COLOR SELECTION ELECTRODE

Jan Van Der Waal, and Johannes M. A. A. Compen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,127

Claims priority, application Netherlands, Jul. 16, 1980, 8004075

Int. Cl.³ H01J *29/07*

U.S. Cl. 313—402 **7 Claims**

1. A color display tube comprising an envelope containing means for producing a number of electron beams, a display screen having areas for luminescing in a corresponding number of associated colors, and a color selection electrode disposed adjacent the display screen and having a plurality of apertures situated to effect passage of only the portions of each beam which will impinge on the screen areas of the associated color, said color selection electrode being covered on the side remotte from the display screen with a layer of material including a heavy metal having an atomic number exceeding 70,

characterized in that the thickness of the material covering the color selection electrode surface extending between the apertures corresponds to a weight of approximately 0.2 to 2 mg/cm^2 and the thickness of the material covering walls defining said apertures corresponds to a weight which does not exceed 0.2 mg/cm^2.

4,442,377

PHOSPHORS

Malcolm Higton, and Aron Vecht, both of London, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, United Kingdom

Continuation of Ser. No. 365,335, Apr. 5, 1982, abandoned, which is a division of Ser. No. 128,552, Mar. 10, 1980, Pat. No. 4,365,184, which is a continuation of Ser. No. 928,696, Jul. 27, 1979, abandoned, and a continuation of Ser. No. 801,211, May 27, 1977, abandoned. This application Mar. 10, 1983, Ser. No. 474,059

Claims priority, application United Kingdom, Jun. 1, 1976, 22697/76

Int. Cl.³ H05B *33/10, 33/14*

U.S. Cl. 313—503 **21 Claims**

1. A process for making a DC electroluminescent device including the steps of

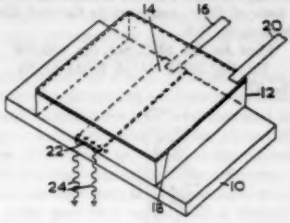
a. producing phosphor particles including a sulphide selected from the group consisting of strontium and calcium sulphide mixed with a dopant selected from the group consisting of europium, terbium, and erbium,

b. coating said phosphor particles with an element of Group Ib of the Periodic Table to introduce said element onto the outer surface of said particles,

c. embedding the coated particles in a matrix,

d. arranging the resulting particle bearing matrix as a phosphor layer in contact with two electrodes, and

e. passing a forming direct electrical current between the two electrodes until the electrical resistance is increased in



a localized and predetermined region of the phosphor layer.

4,442,378

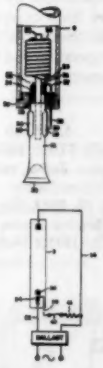
HIGH PRESSURE SODIUM VAPOR LAMP HAVING RESISTANCE HEATER MEANS

Robert G. Frey, Strongsville, and Charles I. McVey, Shaker Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 30, 1982, Ser. No. 403,899

Int. Cl.³ H05B *41/16*

U.S. Cl. 315—47 **15 Claims**

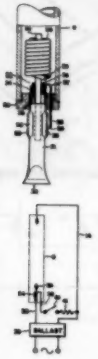


1. An improved high pressure sodium vapor lamp having a tubular light-transmitting ceramic envelope containing a reservoir of sodium-mercury amalgam in excess of the quantity vaporized during lamp operation and thermionic electrodes being sealed into its ends, wherein the improvement comprises further including within said ceramic envelope resistance heater means including a resistive heating element disposed adjacent said reservoir of sodium-mercury amalgam and electrically connected with respect to said electrodes to be supplied with electric current other than the lamp current which is actuated before the lamp operating discharge is established between said electrodes in order to reduce the starting voltage level for lamp operation but which is reduced when the lamp is started.

4,442,379
HIGH PRESSURE SODIUM VAPOR LAMP HAVING RESISTANCE HEATER MEANS

Robert G. Frey, Strongsville, and Charles I. McVey, Shaker Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 30, 1982, Ser. No. 403,900
Int. Cl.³ H05B 41/16; H01J 61/56
U.S. Cl. 315—47 14 Claims

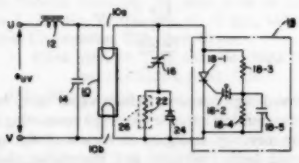


1. An improved high pressure sodium vapor lamp having a tubular light-transmitting ceramic envelope containing a reservoir of sodium-mercury amalgam in excess of the quantity vaporized during lamp operation and thermionic electrodes being sealed into its ends, wherein the improvement comprises further including within said ceramic envelope resistance heater means including a resistive heating element disposed adjacent the amalgam reservoir and electrically connected with respect to said electrodes to be supplied with electric current other than the lamp current responsive to thermal switch means to increase the quantity of amalgam being vaporized during said lamp operation and thereby help maintain the desired lamp color temperature.

4,442,380
DISCHARGE TUBE FIRING DEVICE

Hiromi Adachi, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,169
Claims priority, application Japan, Sep. 11, 1980, 55-126597
Int. Cl.³ H05B 39/00, 37/00
U.S. Cl. 315—101 6 Claims

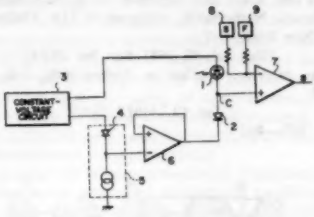


1. A discharge tube firing device comprising: a discharge tube; an inductive stabilizer connected in series with said discharge tube; a first semiconductor switch and a nonlinear dielectric element each connected in parallel to said discharge tube; a second semiconductor switch connected in series with said nonlinear dielectric element and in parallel to said first semiconductor switch, said second semiconductor switch serving as a charging circuit for said nonlinear dielectric element; and a discharging circuit connected in parallel to said second semiconductor switch.

4,442,381
AUTO STROBE CONTROL CIRCUIT

Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan

Filed Aug. 30, 1982, Ser. No. 413,090
Int. Cl.³ H05B 41/32
U.S. Cl. 315—151 7 Claims

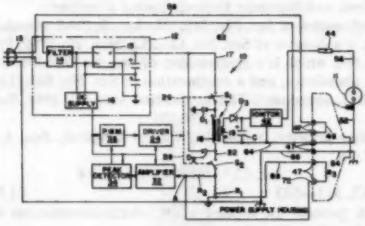


1. An auto strobe control circuit comprising a flash stopping signal generating circuit for measuring the luminance of an object exposed to light emitted from a flash tube by a photometric circuit containing a photoelectromotive force type light receiving element, sending the obtained photometric value and information on film sensitivity and aperture value to an operational amplifier to subject said value and said information to an arithmetic operation, and generating a flash stopping signal when the value calculated by the arithmetic operation reaches a predetermined light amount, said photometric circuit essentially consisting of said light receiving element and a log-conversion diode connected in series with a constant-voltage circuit, and a temperature compensation circuit connected with said log-conversion diode, said photometric value being sent out from a connection point between said light receiving element and said log-conversion diode.

4,442,382
CONSTANT POWER SWITCHING POWER SUPPLY

William C. Fleck, Palisades Park, N.J., assignor to Chiu Technical Corporation, Kings Park, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,136
Int. Cl.³ G05F 1/00; H05B 41/16
U.S. Cl. 315—287 10 Claims



1. Apparatus for delivering DC electrical power at a constant rate to continuously operating load means comprising:

a. means for generating a series of spaced, generally sawtooth shaped waves;

b. means for initiating said waves at a predetermined unvarying frequency;

c. means in response to the peak current reached by said waves to terminate said pulses at times so as to maintain a preselected peak current; and

d. means for delivering the electrical energy in said sawtooth

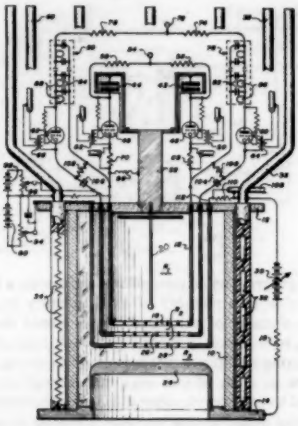
waves to said load means during the periods of time between said sawtooth waves, said power being delivered to said load means being thereby maintained at a constant, predetermined level irrespective of variations in line voltage and impedance of said load means.

4,442,383

PLASMA SWITCH

Alan E. Hill, Box 5444A, Rte. 5, Albuquerque, N. Mex. 87123

Filed Mar. 8, 1982, Ser. No. 355,894
Int. Cl.³ H01J 11/04
U.S. Cl. 315—349 **13 Claims**



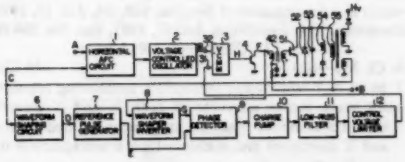
1. A circuit for use in an energy pulse system including a plasma switch to selectively conduct current pulses between an energy source and a load, said circuit having first, second, and third states, said circuit in its first state being adapted to render said plasma switch non-conductive, in its second state to form a plasma within a restrained volume in said switch, and in its third state to render said plasma switch conductive.

4,442,384

HORIZONTAL DEFLECTION CIRCUIT

Hitoshi Maekawa; Michitaka Osawa, and Kunio Ando, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,880
Claims priority, application Japan, Oct. 19, 1981, 56-165840; Nov. 9, 1981, 56-178381
Int. Cl.³ H01J 29/70, 29/76
U.S. Cl. 315—399 **5 Claims**



1. A horizontal deflection circuit comprising:

horizontal oscillator means;

horizontal drive means including a horizontal drive transistor turned on and off by an output pulse from said horizontal oscillator means;

horizontal output means including a horizontal output transistor turned on and off by an output pulse from said horizontal drive means;

variable pulse generator means including a first input terminal connected to said horizontal oscillator means, an output terminal connected to said horizontal drive means, and a second input terminal, said variable pulse generator means generating at said output terminal a pulse synchronous with the pulse applied to said first input terminal and terminated at a time point determined in accordance with a DC voltage applied to said second input terminal;

reference pulse generator means connected to said horizontal output means for generating a reference pulse delayed from a horizontal flyback pulse by a predetermined time;

phase detector means for detecting the phase difference between the drive pulse generated at the collector of said horizontal exciting transistor and the reference pulse, and

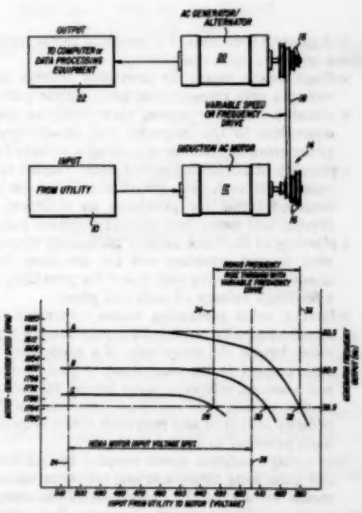
control means for supplying said second input terminal of said variable pulse generator means with a voltage converted into direct current from the output of said detector means in a direction to dampen the variations of the drive pulse.

4,442,385

VARIABLE FREQUENCY DRIVE FOR A MOTOR-GENERATOR/ALTERNATOR SET

Robert J. Van Sickle, Richmond, Va., assignor to Power Distribution, Inc., Richmond, Va.

Filed Feb. 10, 1983, Ser. No. 465,590
Int. Cl.³ H02P 7/66
U.S. Cl. 318—140 **3 Claims**



1. A method of operating a motor-generator/alternator set used to supply power to computer or data processing equipment, said motor-generator/alternator set having a synchronous speed of 1800 rpm at 60 Hz with a desired frequency variation of ±0.5 Hz which comprises the steps of

a. supplying commercial power to an induction motor to drive said induction motor at a speed below said synchronous speed,

b. introducing a speed changer between said induction motor and said generator/alternator so said generator/alternator can produce a frequency greater than said synchronous frequency but within said desired frequency variation therefrom,

1. whereby upon the failure of said commercial power,

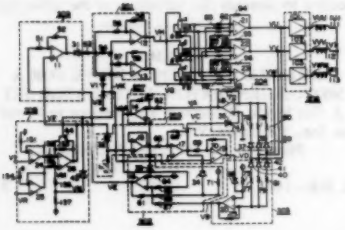
power from said generator/alternator remains within the desired frequency range for a longer period of time than power from a comparable generator/alternator driven at lower speed.

4,442,386

CONTROL APPARATUS OF TRANSISTOR MOTOR

Ryohei Uchida; Tatsuo Yamasaki; Toshio Idei, all of Nagaokakyo; Toshio Tatsutani, and Ippei Hagiwara, both of Nakatsugawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,203
Claims priority, application Japan, Feb. 10, 1982, 57-21526
Int. Cl.³ H02K *29/00*
U.S. Cl. 318—254 **16 Claims**



1. A control apparatus of a transistor motor having multiple phase armature coils, comprising:

voltage source means for providing positive and negative voltages with respect to an intermediate potential,

a plurality of sensor means, each detecting magnetic flux equivalent to the magnetic flux interlinking each said phase armature coil for providing a detected signal,

a plurality of amplifying means, each coupled to said sensor means and each said armature coil for amplifying said detected signal for providing an electrical output for driving said motor to each said armature coil,

a plurality of feedback voltage generating means, each coupled to said armature coil for detecting the electrical quantity for driving said motor for providing the same as a feedback voltage of each said phase,

reference value generating means responsive to a control signal externally provided for generating a first reference value having the magnitude of a predetermined relation with respect to the magnitude of said feedback voltage and a second reference value having the same magnitude as that of said first reference value and of the opposite polarity to that of said reference value, with said intermediate potential as a reference,

first voltage addition means coupled to said feedback voltage generating means and said reference value generating means for adding the magnitude of the component in a more positive direction than said first reference value within the instantaneous values of said feedback voltages, with said first reference value as a reference, for providing a first addition output voltage,

second voltage addition means coupled to said feedback voltage generating means and said reference value generating means for adding the magnitude of the component in a more negative direction than said second reference value within the instantaneous values of said feedback voltages, with said second reference value as a reference, for providing a second addition output voltage,

third voltage addition means coupled to said first and second voltage addition means for adding said first and second addition output voltages for providing a third addition output voltage, and

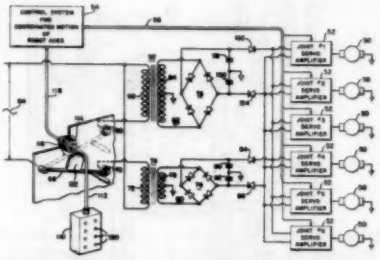
difference control means coupled to said third voltage addition means and said sensor means for controlling the magnitudes of said detected signals such that the magnitude of said third addition output voltage may be consistent with the magnitude of said control signal.

4,442,387

SAFE PROGRAMMING SYSTEM FOR INDUSTRIAL ROBOTS

Torsten H. Lindbom, Brookfield, Conn., assignor to Unimation, Inc., Danbury, Conn.

Filed Nov. 25, 1981, Ser. No. 324,697
Int. Cl.³ G05B *19/42*
U.S. Cl. 318—568 **21 Claims**



1. In a programmable manipulator apparatus, a manipulator arm movable in a plurality of axes, memory storage means having a plurality of command signals stored therein corresponding to different positions to which said arm is to be moved during a playback cycle, means for moving said manipulator arm in each of said axes, first power driving means controlled by said stored command signals and controlling said arm moving means so that said arm is moved to said different positions during a playback cycle, counterbalancing means for said manipulator arm which is effective to reduce the force required to move said arm in each of said axes during an initial teaching mode, and second low power driving means for controlling said arm moving means during said initial programming mode, the maximum force which can be exerted on said manipulator arm by said second low power driving means during said initial teaching mode being limited to a predetermined value which is insufficient to cause injury to teaching personnel.

4,442,388

X-Y ADDRESSABLE WORKPIECE POSITIONER HAVING AN IMPROVED X-Y ADDRESS INDICIA SENSOR

Edward H. Phillips, Mountain View, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Continuation of Ser. No. 136,816, Apr. 2, 1980, abandoned, which is a continuation of Ser. No. 925,454, Jul. 17, 1978, abandoned. This application Jul. 27, 1981, Ser. No. 286,985
Int. Cl.³ G05B *1/06*; G01J *1/20*
U.S. Cl. 318—640 **48 Claims**

7. In an X-Y addressable workpiece positioning apparatus:

work stage means movable in both X and Y directions within a common plane of movement defined by the X and Y directions and within which a workpiece is to be positioned;

the work stage means including holding means for holding the workpiece for movement with the work stage means;

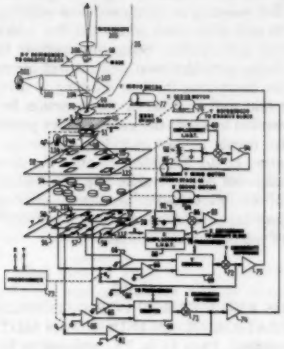
indicia means comprising a two-dimensional array of X and Y coordinate positioning indicia affixed to the work stage means and movable therewith for effecting positioning of the work stage means;

relatively stationary sensor stage means for determining the X and Y coordinates of the work stage means;

projector means for projecting an enlarged image of at least

a portion of the array of X and Y coordinate positioning indicia onto the sensor stage means;

the sensor stage means including at least two pairs of pattern recognition windows and corresponding sensing means for independently recognizing and sensing the X and Y coordinate positioning indicia of the enlarged image to derive a sensed output through each window of each pair of pattern recognition windows and determine the X and Y coordinates of the position of the work stage means, the sensing means being coupled for subtracting the sensed



output derived through one window of each pair of pattern recognition windows from the sensed output derived through the other window of the same pair to cancel ambient background effects;

comparative means for comparing the X and Y coordinates of the position of the work stage means with the X and Y coordinates of a different position of the work stage means to derive an error output; and

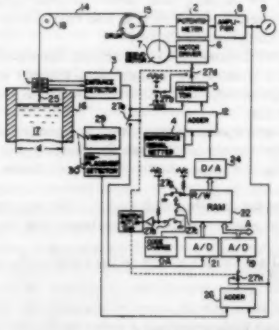
drive means for moving the work stage means and the array of X and Y coordinate positioning indicia to the different position in response to the error output.

4,442,389

APPARATUS FOR MEASURING A METAL SURFACE POSITION

Yasuhiro Sawada, Fuchu; Tadashi Inoue, Noogata, and Toyoaki Nishida, Kitakyushu, all of Japan, assignors to Nippon Steel Corp., Tokyo and Mishima Kosan Co., Ltd., Kitakyushu, both of, Japan

Filed Jun. 8, 1982, Ser. No. 386,387
Claims priority, application Japan, Mar. 22, 1982, 57-45315
Int. Cl.[3] G05D *9/00*
U.S. Cl. 318—642 **7 Claims**



1. An apparatus for measuring a change along a predetermined direction of a surface position of a metallic mass comprising:

a magnetic sensing type metal sensor reciprocably movable along said predetermined direction and arranged in spaced relation to said metal surface,

drive means operative to drive said sensor along said predetermined direction,

follow-surface means for comparing an output of said sensor with a predetermined reference distance value and activating said drive unit in accordance with a difference signal of the comparison for causing said sensor to follow the change along said predetermined direction of the surface position of said metal,

means for determining the surface position of said metal based on a current position of said sensor,

noise storing means for measuring a noise component in the output of said sensor due to factors other than the change of the surface position of said metal and storing said noise component; and

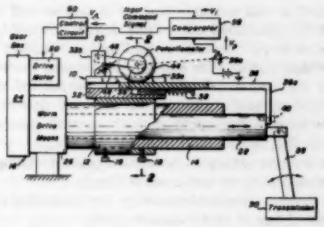
correction means for correcting said difference signal by said noise component stored in said storing means for activating said drive unit by the corrected signal.

4,442,390

FEEDBACK SYSTEM FOR A LINEAR ACTUATOR

Kenneth W. Davis, HHB 2/42 FA New York BN, APO NY, N.Y. 09751

Filed Jul. 6, 1982, Ser. No. 395,383
Int. Cl.[3] G05B *1/06*
U.S. Cl. 318—663 **11 Claims**



1. Feedback means for use in connection with linear actuator means including a pair of relatively linearly displaceable actuator members, and motor means for displacing one of said actuator members relative to the other, comprising

(a) sensing means for sensing the position of said one actuator member relative to the other member, said sensing means including

(1) mounting bracket means adapted for mounting on said other actuator member;

(2) a slide bar connected for longitudinal displacement relative to said mounting bracket means in a direction parallel with the direction of displacement of said one actuator member relative to said other member, said slide bar including a portion arranged for operation by said one actuator member during the linear displacement thereof relative to said other member; and

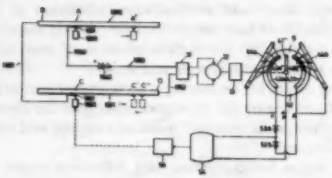
(3) a rotary member connected with said mounting bracket means for rotation by said slide bar during the linear displacement thereof relative to said mounting bracket means, the axis of rotation of said rotary member being contained in a plane normal to the axis of linear displacement of said one actuator member; and

(b) feedback means operable by said sensing means for controlling the operation of said motor means as a function of the position of said one member relative to the other member.

4,442,391
AUTOMATIC CONTROL SYSTEM FOR POSITION FOLLOWING AND RECIPROCATING MOTION OF A CONTROLLED OBJECT

Lee Yu-Kuang, No. 596, Chung Cheng Rd., Chu Pei, Hsing Chu Hsien, China

Filed Oct. 1, 1980, Ser. No. 192,690
The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.
Int. Cl.³ G05B *11/06*
U.S. Cl. 318—663 **23 Claims**



1. Automatic position following control apparatus for controlling a controlled object to follow a demand object, said apparatus comprising:

means for producing a control signal corresponding to the difference in position between the controlled object and the demand object, said control signal producing means comprising a signal source connected in series with first and second variable resistances each having a fixed contact and a movable contact, said first and second variable resistances being series connected with each other such that said fixed contact of said first resistance is connected to said movable contact of said second resistance, and the controlled object and demand object being coupled to respective ones of said first and second resistance movable contacts for conjoint movement therewith such that the resistance, and thus the output, of the circuit formed by said signal source and said first and second resistances is dependent on the respective positions of the controlled object and the demand object;

means for converting said control signal into a displacement corresponding to said control signal;

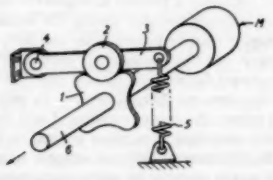
drive means controllable to drive the controlled object in a selected one of two directions; and

control switch means responsive to said signal converting means for controlling said drive means.

4,442,392
ELECTRIC INDEXING DRIVE AND STEPPING MOTOR WITH DRIVE RETARDATION THEREFOR

Donald L. Hore, Bristol, England, assignor to Hornet Electrical Company Limited, England

Filed Apr. 28, 1982, Ser. No. 372,521
Claims priority, application United Kingdom, May 1, 1981, 8113602
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **15 Claims**



1. In an electric stepping motor for driving an indexed rotary drive arrangement, said drive arrangement having a detent mechanism by means of which index positions thereof are determined,

the motor including a drive shaft for driving said drive arrangement, electrical winding means arranged to apply torque to the drive shaft when energized, and control means for energizing the winding means to cause the motor to index the drive shaft and said drive arrangement from a first index position towards a second, adjacent index position against the force of the detent mechanism,

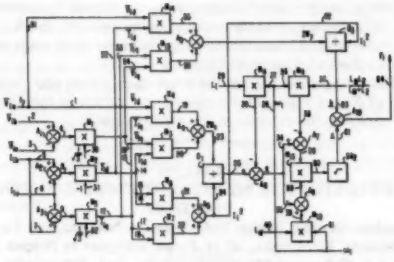
said electrical winding means including a first electrical winding, said drive shaft having a null position in relation to said first winding in which said first winding applies no torque to said drive shaft when said first winding is energized, said null position being intermediate the first and second index positions, and said control means including means for energizing the first winding to drive the drive shaft to said null position in the direction from the first index position towards the second index position, and,

said control means further including means for continuing energization of the first winding after the drive shaft has passed said null position so as to provide electrical retardation of the movement of said drive shaft as the drive shaft approaches said second index position under the action of the detent mechanism.

4,442,393
APPARATUS AND METHOD FOR DETERMINING THE OPERATION OF AN INDUCTION MOTOR

Alberto Abbondanti, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 4, 1982, Ser. No. 354,700
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—802 **14 Claims**



1. Apparatus for the determination of the load resistance of a rotating field motor, having a squirrel cage rotor, supplied under three terminal voltages and three line currents, comprising:

first means for sensing said three terminal voltages and means for sensing two of said line currents for deriving corresponding sensed signals;

second means responsive to said sensed signals for deriving direct and quadrature voltage and current component signals representative of said sensed terminal voltages and line currents;

third means responsive to said direct and quadrature voltage and current component signals for deriving the following quantity in real time: motor overall reactance $2W_X/I_1^2$; and

fourth means for deriving with said quantity a representation of the load resistance R_L in accordance with the formula:

$$R_L=\omega_1(L_M+L_2)([a-\omega_1 L_M L_2/(L_M+L_2)]/[\omega_1 L_M-a])^{\frac{1}{2}}$$

where

L_M is the leakage inductance,

L_1 is the stator inductance,

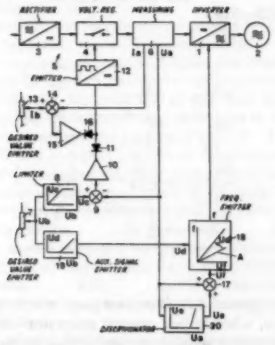
L_2 is the rotor inductance,
ω_1 is the terminal line frequency,
W_X being the reactive power equal to $(V_1 I_1 \text{ Sin } \phi)\frac{1}{2}$
I_1 being the stator current, V_1 the stator voltage
ϕ the phase angle between V_1 and I_1,
a is the air gap reactance equal to $2W_X/I_1{}^2-\omega_1 L_1$, the parallel combination of stator and rotor leakage reactances $\omega_1 L_M L_2/(L_M+L_2)$, and the stator leakage reactance $\omega_1 L_1$, thereby to provide a signal representative of the instantaneous load resistance R_L of the motor.

4,442,394

INVERTER CIRCUIT FOR OPERATING A SPEED-CONTROLLABLE ASYNCHRONOUS MOTOR

Hans M. Beierholm, Fynshav, and Niels J. Henriksen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed May 28, 1981, Ser. No. 267,743
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021119
Int. Cl.³ H02P 5/34
U.S. Cl. 318—807 **6 Claims**



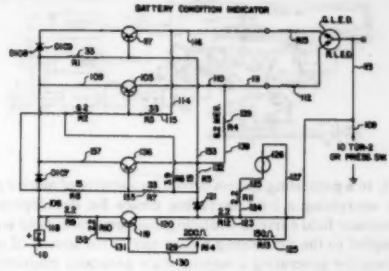
1. An inverter control circuit for operating a speed-controllable asynchronous motor, comprising, control means outputting in response to frequency related voltage input settings voltage and frequency signals which are substantially proportionally related within a range limited by a predetermined nominal voltage and a corresponding nominal frequency, a voltage regulator, an inverter having input terminal means connected to said voltage regulator, frequency regulating means for said inverter having variable transfer characteristics, defined by curves, and a summating input terminal connected to said inverter input terminal means, auxiliary speed regulating means connected between said voltage input settings and said frequency regulating means for increasing said inverter frequency by alternating said frequency regulating means transfer characteristics when the setting of said control means exceeds its nominal voltage setting, excess voltage discriminating means connected between said inverter input terminal means and said summating input terminal for increasing said inverter frequency by supplementing the input at said summating input of the voltage at said inverter input terminal means, said voltage discriminating means having transfer characteristics with a threshold being a predetermined value larger than said nominal voltage.

4,442,395

PUMP FAILURE PROTECTION FOR LIQUID TRANSMISSION PIPELINES

Louis E. Salina, and Joseph E. Lescovich, both of Bridgeville, Pa., assignors to GA Industries Inc., Mars, Pa.

Division of Ser. No. 948,040, Oct. 2, 1978, Pat. No. 4,273,513. This application Mar. 16, 1981, Ser. No. 243,878
Int. Cl.³ H02J 7/10
U.S. Cl. 320—48 **7 Claims**



1. A battery condition indicator for use in a circuit comprising a DC power supply connected across the terminals of a nickel cadmium battery, comprising:

(a) a first main branch leading to the positive side of the power supply;

(b) a second main branch leading to the negative side;

(c) four transistor circuits connected in parallel with said positive main branch and each including a transistor, the four circuits and transistors being herein designated 1 to 4, the fourth transistor in the series 1 to 4 having its emitter connected through a circuit with the negative main branch of the DC current source;

(d) a connection from the negative emitter circuit of the fourth transistor to the base of the first emitter, said connection including a resistor;

(e) the second transistor having its base connected with the collector-to-green LED circuit of the first transistor;

(f) a zener diode having a connection from the negative emitter circuit of the fourth diode through said zener diode with the base of the first transistor with a resistor between the zener diode and the base of said first transistor;

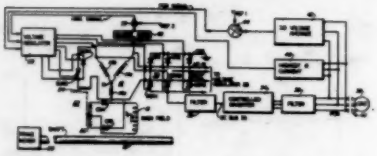
(g) a shunt circuit around said last-named resistor wherein the base of the third transistor is connected through a resistor to the connection leading from the zener diode to the base of the first transistor at a point between the zener diode and the resistor in said connection, the collector circuit of the third transistor being also connected to the connection between the zener diode and the base of the first transistor but joining said connection between the said resistor in said connection; and

(h) the said four parallel transistor circuits as herein defined being thereby so arranged that a normal charging current path will put a negative bias on the base of the first transistor to light the green LED, thereby extinguishing the red, but lighting the red by an absence of adequate negative voltage in the base of the first transistor, and the lighting of the green by the application of adequate negative voltage through the zener diode circuit to bias the first transistor, the green LED being extinguished when the charging voltage is above normal by the positive voltage from the collector of the third transistor offsetting the negative flow from the zener diode, but by reason of the resistor in the connection between the zener diode and the base of the first transmitter enabling the zener diode to continue to supply a negative bias to the base of the third diode.

4,442,396
GENERATOR SYSTEM WITH FAULT CONDITION EXCITATION

David J. Hucker, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 31, 1983, Ser. No. 480,727
Int. Cl.³ H02P 9/10, 9/14
U.S. Cl. 322—21 16 Claims



1. In a generating system driven by a source of motive power for energizing a load, including means for developing main generator field current, a rotating main generator field winding coupled to the developing means and to the source of motive power for generating a moving main generator magnetic field and a stationary main generator armature disposed in the moving main generator magnetic field for generating main generator output current, the improvement comprising:

means for sensing the voltage at the load;

means coupled to the load voltage sensing means for detecting when the load voltage is less than a predetermined value;

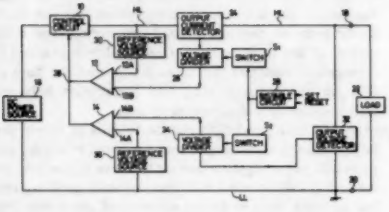
means for sensing the voltage at the main generator armature; and

means responsive to the detecting means and coupled to the developing means and the armature voltage sensing means for controlling the main generator field current in response to the sensed voltage at the main generator armature when the sensed voltage at the load is less than the predetermined value.

4,442,397
DIRECT CURRENT POWER CIRCUIT

Hiroichi Ishikawa, Kawaguchi, and Toshio Mikami, Sakado, both of Japan, assignors to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,669
Claims priority, application Japan, Jan. 26, 1981, 56-9859
Int. Cl.³ G05F 1/56
U.S. Cl. 323—275 13 Claims



1. A DC power circuit having two different output characteristics, comprising:

a DC power source;

a pair of output terminals;

a first control means provided between said DC power source and said pair of output terminals for controlling the voltages as well as currents supplied to a load from said DC power source;

an output current detector for detecting the output current from said first control means for providing a first control potential proportional to the detected current;

an output voltage detector which is coupled between said pair of output terminals for detecting voltage applied to the load and which provides a second control potential proportional to the detected voltage;

a second control means for selectively assuming one of two stable states in response to an external control;

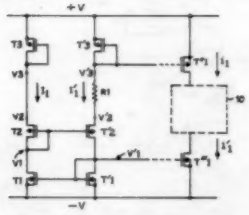
and

a third control means which is connected to said output current detector and said output voltage detector for receiving said first and said second control potentials therefrom, respectively, and which is also connected to said first and said second control means and which controls circuit parameters in response to the state of said second control means for controlling said first control means based on the received two control potentials.

4,442,398
INTEGRATED CIRCUIT GENERATOR IN CMOS TECHNOLOGY

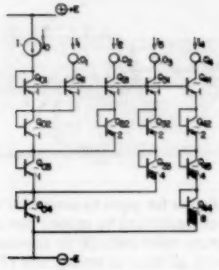
Jean-Claude Bertails, and Christian Perrin, both of Grenoble, France, assignors to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux-E.F.C.I.S., Grenoble, France

Filed Nov. 9, 1981, Ser. No. 319,791
Claims priority, application France, Nov. 14, 1980, 80 24232
Int. Cl.³ G05F 3/20
U.S. Cl. 323—315 6 Claims



1. An integrated-circuit current generator formed by CMOS technology, wherein said current generator comprises a voltage source which supplies in parallel two similar assemblies of three MOS transistors in series, each transistor of one assembly being such as to correspond to a similar transistor having the same channel type in the other assembly and the geometry ratios of the similar transistors being the same in the case of all the transistors of the assemblies, the first transistors of a first channel type being such as to have a common threshold voltage and gates connected to each other, the gate of the transistor of the second assembly being also connected to its drain, the second transistors of the opposite channel type being such as to have a common threshold voltage and gates connected to each other, the gate of the transistor of the first assembly being also connected to its drain, the gates of the third transistors of the opposite channel type being connected to their drains and being such as to have different threshold voltages, a resistor of known value being inserted in series between the second and third transistor of one of said assemblies, at least one additional MOS transistor being provided in addition to said assemblies in order to serve as a constant supply-current generator, the source and the gate of said additional transistor being connected to the source and to the gate of the first or the third transistor of one of said assemblies, the threshold voltage of said additional transistor being the same as that of the transistor to which it is thus connected.

4,442,399
CURRENT SOURCE CIRCUIT
Katsumi Nagano, Hiratsuka, Japan, assignor to Tokyo Shibaura Denki Dabushiki Kaisha, Kawasaki, Japan
Filed Sep. 16, 1981, Ser. No. 302,774
Claims priority, application Japan, Oct. 17, 1980, 55-145193
Int. Cl.³ G05F 3/20
U.S. Cl. 323—315 12 Claims



1. A current source circuit for producing a plurality of currents with their own weights, comprising:

a first transistor including a collector connected to a first power source through a current source, and a base electrode coupled to the collector, the emitter area thereof being a reference value "1";

a first group of (N−1) transistors including a first transistor, a second transistor, . . . , a (K−1)th transistor, . . . , and an (N−1)th transistor connected in series, the base electrode of each said first group transistors being connected to the collector thereof, the collector of said first transistor of said first group transistors being connected to the emitter of said first transistor, the emitter of said (N−1)th transistor of said first group of transistors being connected to a second power source, and the emitter area of each of said first group transistors being a reference value "1";

a second group of (N) transistors including a first transistor, a second transistor, . . . , a Kth transistor, . . . , and an Nth transistor each having a base electrode connected to the base electrode of said first transistor, the collectors of said first, second, . . . , Kth, . . . , and Nth transistors of said second groups transistors producing currents with their own weights;

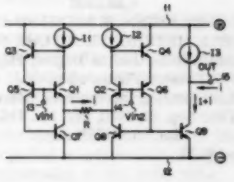
the emitter of said first transistor of said second group of transistors being connected to the emitter of said first transistor;

a third group of transistors including first, second, . . . , (K−1)th, . . . , and (N−1)th subgroups, the base electrode of each of said third group transistors being connected to the collector thereof; said first subgroup including a single subgroup transistor connected at its collector to the emitter of said second transistor of said second group transistors, and at its emitter to the emitter of said first transistor of said first group transistors; said second subgroup including first and second transistors connected in series, said first transistor of said second subgroup being connected at its collector to the emitter of a third transistor of said second group transistors, said second transistor of said second subgroup being connected at its emitter to the emitter of said second transistor of said first group transistors; said (K−1)th subgroup including a first transistor, a second transistor, . . . , and a (K−1)th transistor, said first transistor of said (K−1)th subgroup being connected at its collector to the emitter of said Kth transistor of said second group transistors and said (K−1)th transistor of said (K−1)th subgroup being connected at its emitter to the emitter of said (K−1)th transistor of said first group transistors; and said (N−1)th subgroup including a first transistor, a second transistor, . . . , and an (N−1)th transistor connected in series, said first transistor of said (N−1)th subgroup being connected at its collector to the emitter of said Nth transistor of said second group transistors, and said (N−1)th transistor of said (N−1)th subgroup being connected at its emitter to the emitter of said (N−1)th transistor of said first group transistors;

the product of emitter areas of said Kth transistor of said second group transistors and each transistor of said (K−1)th subgroup being

$$2^{\sum_{I=1}^{I=K}(I-1)}.$$

4,442,400
VOLTAGE-TO-CURRENT CONVERTING CIRCUIT
Katsumi Nagano, Shimonoseki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jul. 7, 1982, Ser. No. 396,075
Claims priority, application Japan, Jul. 8, 1981, 56-106518
Int. Cl.³ G05F 3/20
U.S. Cl. 323—315 4 Claims



1. A voltage-to-current converting circuit comprising:

a differential pair of first and second transistors each having base, emitter and collector;

a resistor connected between the emitters of said first and second transistors;

first and second constant current sources respectively connected between the collector of said first transistor and a first power supply terminal and between the collector of said second transistor and the first power supply terminal;

third and fourth transistors each having base, emitter and collector, said third transistor having its collector-emitter path connected between the emitter of said first transistor and a second power supply terminal and said fourth transistor having its collector-emitter path connected between the emitter of said second transistor and the second power supply terminal;

first and second base current supply means respectively connected between the base of said third transistor and the first power supply terminal and between the base of said fourth transistor and the first power supply terminal for supplying base currents to said third and fourth transistors;

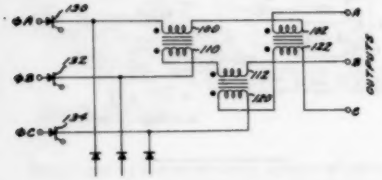
an output transistor having its collector connected to an output terminal, its emitter connected to the second power supply terminal and its base connected to the base of said fourth transistor; and

a third constant current source connected between the collector of said output transistor and the first power supply terminal.

4,442,401
NEGATIVE COUPLED INDUCTORS FOR POLYPHASE CHOPPERS

Robert S. Jamieson, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jan. 8, 1982, Ser. No. 338,121
Int. Cl.³ H02M 3/135
U.S. Cl. 323—351 6 Claims



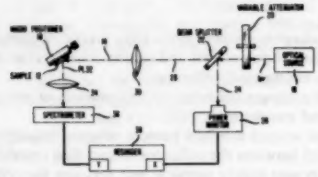
1. In a multiphase chopper wherein the output of each chopper is coupled via an output inductance to the load, the improvement wherein:

the output inductance of each phase is comprised of a first inductance and a second inductance, and each of said first inductances and said second inductances of each phase are respectively negatively coupled to a corresponding one of said output inductances in separate adjacent neighboring phases.

4,442,402
PHOTOLUMINESCENCE METHOD OF TESTING DOUBLE HETEROSTRUCTURE WAFERS

Paul R. Besomi, Edison; Joshua Degani, Highland Park, and Daniel P. Wilt, Scotch Plains, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 10, 1982, Ser. No. 416,474
Int. Cl.³ G01R 31/26
U.S. Cl. 324—158 D 6 Claims



1. A manufacturing process including a method of testing a double heterostructure wafer having a narrow bandgap active layer between a pair of wider bandgap cladding layers, the method including the steps of:

(a) directing an excitation beam of optical radiation at the wafer, the radiation energy being chosen so that it is absorbed in the active layer, but not in the cladding layers, thereby to generate photoluminescence from the active layer,

(b) varying the intensity of the excitation beam so as to vary the intensity of the photoluminescence,

(c) detecting the photoluminescence,

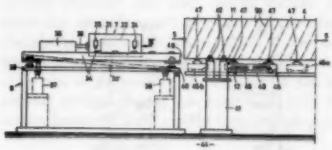
(d) generating a photoluminescence intensity versus excitation beam intensity characteristic,

(e) selecting the wafer if the characteristic exhibits a photoluminescence threshold P_{th} which indicates that the wafer has a p-n junction in the active layer, and rejecting the wafer if the characteristic exhibits no such threshold which indicates that the wafer has a p-n junction outside the active layer.

4,442,403
TESTING INSTALLATION FOR PIPES HAVING AN INTERNAL TESTING UNIT DRIVEN BY THE ROTATION OF THE PIPE

Carl-Ludwig Pohler, Lutzowstrasse 123, D-5650 Solingen 1, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 249,887
Int. Cl.³ G01N 27/72, 27/82; G01R 33/12
U.S. Cl. 324—220 14 Claims



1. Testing installation for pipes to determine surface defects and core defects, characterized by at least one testing zone (1, 2) comprising a rotary roller track (3) for rotatingly driving the pipe (4) to be tested, an internal testing unit (7) movable in a direction along the longitudinal axis of the pipe, within the pipe (4), parking stations (9, 10) adjustable to the pipe length at both ends of the testing zone (1, 2) for accommodating the internal testing unit (7) during pipe change, an external testing unit (12) movable along the outer pipe wall (11), and conveying devices (16) for the introduction and for the removal of the pipes (4) into and from the testing zone (1, 2), respectively, wherein the internal testing unit (7) is a cylindrical housing (21) equipped with built-in contactless testing devices (22) and arranged on a running gear frame (23) with a forward running gear and a rearward running gear (24, 25), and wherein the running gears (24, 25) consist of a drive shaft (26) and two supporting rollers (27, 28) assuming a driving position (26', 27', 28') obliquely to the longitudinal axis (5—5) of the pipe (4) to be tested, traveling on the inner pipe wall (6), and being driven by the revolving motion of the pipe (4) to be tested, which latter is located between the parking stations (9, 10).

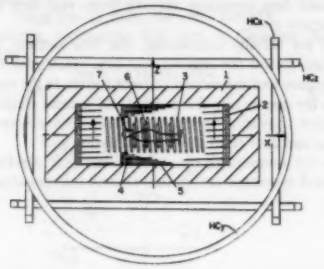
4,442,404
METHOD AND MEANS FOR THE NONINVASIVE, LOCAL, IN-VIVO EXAMINATION OF ENDOGENEOUS TISSUE, ORGANS, BONES, NERVES AND CIRCULATING BLOOD ON ACCOUNT OF SPIN-ECHO TECHNIQUES

Wilfried H. Bergmann, Lerchenweg 3, D-5483 Bad Neuenahr, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 103,227, Dec. 13, 1979. This application Dec. 1, 1981, Ser. No. 326,344
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1978, 2854774
Int. Cl.³ G01N 27/00
U.S. Cl. 324—309 5 Claims

1. An apparatus for noninvasive, localized, in-vivo examination of tissue, organs, bones, nerves and circulating blood for the purpose of medical check-ups or of case control of therapeutic measures by means of spin-echo techniques of the type having a transmission and receiving coil system of a nuclear magnetic resonance equipment encompassing the test person completely, or at least that region of exploration, and means for detection and computation of the signals, comprising means for determining the density of nuclides with non-zero nuclear magnetic moment within a selected control volume, means for determining the spin-lattice relaxation time (T_1) and the spin-spin relaxation time (T_2), means for determining the components of the diffusion tensor (D_{ij}) and evaluating the contraction experienced by the spin-spin relaxation time (T_2) in consequence of the state of flow of blood within said control volume, a detection coil system, means for operating said detection coil system within the range of superconductivity below

about 1.85° K., an electromagnet providing a homogeneous, with respect to time extremely constant magnetic field H_0, magnetic coils for the generation of slowly in time and space variable three dimensional linear and/or quadratic field gradients for confining and controlling the region of resonance into the control volume and for conducting a hydrodynamic analysis within said control volume and for the remote control of its



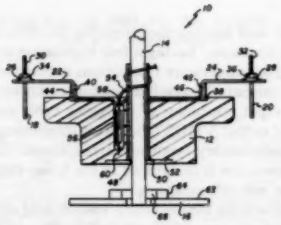
position as a function of involuntary movements within the test person, another coil system for the production of fast three-dimensional magnetic field gradients pulses, a gradiometer detection coil of the first or second order for reduction of perturbations by exterior fields preferably arranged coaxially with respect to the transmission coil, and a microwave biased superconducting quantum interference device operative within the range of superconductivity.

4,442,405

FLOAT ASSEMBLY FOR A SENSOR

Raymond J. Andrejasich, Carmel, and Ralph A. Perry, Indianapolis, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed May 3, 1982, Ser. No. 373,850
Int. Cl.³ G01N *27/02*
U.S. Cl. 324—439 **10 Claims**



1. A float assembly for a sensor, comprising:

a float member having a channel means passing therethrough;

means for mounting a sensor on said float;

guide means passing through said channel means for guiding the movement of said float member;

stop means located on said guide means for limiting the movement of said float means, said stop means including a magnet; and

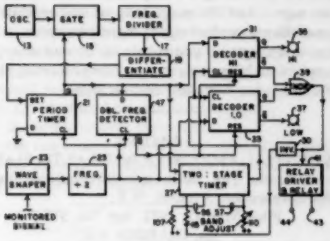
magnetically activated switch means included in said float member for activating when in proximity to said stop means magnet for indicating that said float member is in proximity to said stop means.

4,442,406

FREQUENCY MONITOR WITH ADJUSTABLE TOLERANCE

Earl W. Voss, Colcord, Okla., assignor to Diversified Electronics, Inc., Evansville, Ind.

Filed Sep. 29, 1981, Ser. No. 306,756
Int. Cl.³ H03D *3/02*; H03L *7/00*; H03K *5/22*
U.S. Cl. 328—134 **15 Claims**



1. Frequency monitor apparatus for detecting and indicating departures of a monitored signal frequency from a reference frequency by greater than a preset tolerance comprising

first means for generating a first timing pulse having a period equal to a multiple not less than two of one-half cycle of a reference frequency,

second means for generating a second timing pulse having a period equal to a multiple not less than two of one-half cycle of a monitored signal,

said first means being connected to start in synchronism with said second means,

third means responsive to the end of the period of either said first means or second means to produce a delay pulse substantially shorter than either of said timing pulse periods, and

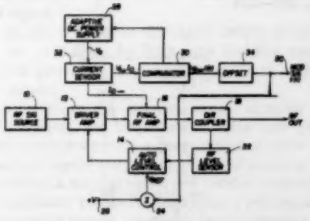
fourth means for detecting the failure of either said first timing pulse period or said second timing pulse period to end at the termination of said delay pulse.

4,442,407

TWO LOOP AUTOMATIC LEVEL CONTROL FOR POWER AMPLIFIER

Thomas R. Apel, Cedar Rapids, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 11, 1982, Ser. No. 387,307
Int. Cl.³ H03G *3/20*; H03C *1/00*
U.S. Cl. 330—128 **13 Claims**



1. Control circuit means for maintaining high efficiency in a modulated RF power amplifier having a modulating signal applied thereto and powered by an adaptive power supply, comprising:

at least one control loop including,

means providing a power supply potential to at least one

amplifier stage of said power amplifier from said adaptive power supply,

sensor means for sensing an operational parameter of said at least one amplifier stage and providing a signal in accordance therewith,

means providing a signal corresponding to the weighted sum of the magnitude of said power supply potential and said operational parameter signal,

means for providing a comparison between the weighted sum signal and the magnitude of said modulating signal generating a control signal therefrom, and

means coupling said control signal to said adaptive power supply which operates to vary said power supply potential in accordance with said control signal.

4,442,408

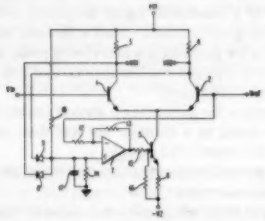
DIFFERENTIAL AMPLIFIER WITH AUTO BIAS ADJUST

Trung Le, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1982, Ser. No. 377,771

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—261 **9 Claims**



1. In a differential amplifier circuit having first and second complimentary outputs, the improvement comprising;

means for individually sensing the voltages of both differential amplifier outputs; and

means responsive to the minimum of said sensed differential amplifier output voltages for controlling current flow out of said amplifier to maintain said minimum voltage value at a predetermined, constant level.

4,442,409

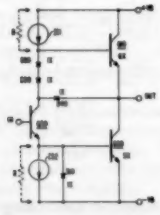
PUSH-PULL NON-COMPLEMENTARY TRANSISTOR AMPLIFIER

Donald R. Preslar, Plainfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,179

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—274 **13 Claims**



7. A push-pull amplifier comprising:

first and second transistors of a like conducitivity type, and a third transistor, each transistor having first, second and control electrodes and having a principal conduction path between its first and second electrodes controlled by a potential between its control and first electrode;

first and second current sources;

a bridge circuit including a like number greater than one of current dependent potential offset means in each of two arms, the bridge arms terminating in first and second common ends, one of said arms serially including the control and first electrodes of said first transistor with the first electrode of said first transistor remote from said first and second common ends;

means for serially connecting the first current source, the bridge circuit the second and first electrodes of the third transistor and the second current source in the recited order;

means for connecting the control and second electrodes of the second transistor to the respective first electrodes of the third and first transistors respectively; and

means for connecting the control and first electrodes of the second transistor across said second current source.

4,442,410

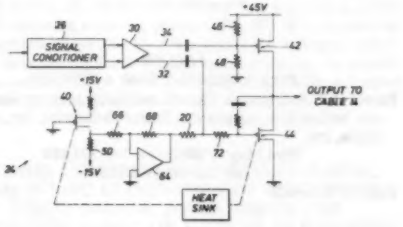
TEMPERATURE STABILIZED AMPLIFIER FOR BOREHOLE USE

Joseph T. Daniel, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 29, 1981, Ser. No. 316,208

Int. Cl.³ H03F *3/18*

U.S. Cl. 330—289 **2 Claims**



1. An oil well logging tool amplifier for driving a well logging cable conductor having a low impedance and adapted to be exposed to temperature fluctuations encountered in a down hole environment, the amplifier circuit comprising:

(a) an output conductor of a logging cable connected to a pair of output VMOS field effect transistors connected in a complementary symmetry arrangement wherein one of the transistors is designated as the lower transistor of the output pair of transistors;

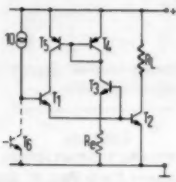
(b) a bias voltage forming third VMOS field effect transistor exposed on a common heat sink to the same temperature fluctuations to which said lower output transistor is exposed to, and further having substantially identical temperature drift characteristics therewith; and

(c) bias voltage transfer circuit means connected from said third transistor and input to said output pair of transistors and including an inverting amplifier coupling an output of said third transistor to the gate of sid lower output transistor in such a manner as to apply a bias thereto which applied bias offsets the temperature dependent drift of said output pair of transistors, and wherein said offset bias maintains said output pair of transistors in a specified range of operative conditions during temperature fluctuations over a specified range.

4,442,411
CIRCUIT FOR THE LOAD-PROPORTIONAL ADJUSTMENT OF THE DRIVING CURRENT OF A SINGLE-ENDED OUTPUT TRANSISTOR OF A TRANSISTOR AMPLIFIER, OPERATED IN A COMMON-EMITTER CIRCUIT

Gerhard Gehring, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,775
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036736
Int. Cl.³ H03F 3/04
U.S. Cl. 330—296 **5 Claims**

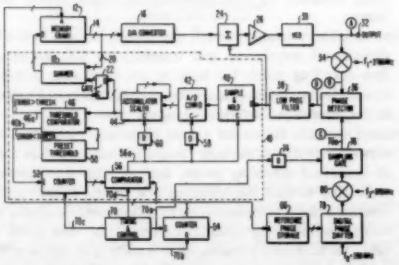


1. Circuit for load-proportional adjustment of a driving current of a single-ended output transistor of a transistor amplifier for a variable load of the output transistor, the output transistor having a base-emitter voltage and being operated in a common emitter circuit, the driving current being fed via a control branch to the output transistor, comprising a sensing transistor stage having an output circuit and being driven by the base-emitter voltage of the output transistor, a transistor serving as a driver transistor for the output transistor and a coupling circuit through which current in the output circuit of said sensing transistor is feedable to said transistor serving as a driver transistor.

4,442,412
PHASE LOCKED-LOOP GENERATOR WITH CLOSED-LOOP FORCING FUNCTION SHAPER

Edwin B. Smith, Medford Lakes, and Richard A. Craft, Cinnaminson, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,433
Int. Cl.³ H03B 3/08
U.S. Cl. 331—1 **8 Claims**

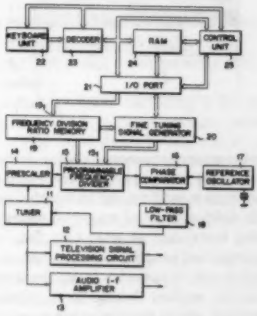


1. In a phase locked loop system which includes:
signal controllable first means for producing an output frequency signal in accordance with a drive signal applied thereto;
second means generating a signal having a phase which at least at selected times corresponds to the phase of the desired output frequency signal;
third means producing an error signal having a value proportional to the phase difference between the output and generated signals;
summing fourth means coupled to said first means to provide said drive signal thereto and having first and second summing input terminals the first responsive to said error signal;
storage fifth means coupled to said fourth means second terminal and producing signals as a function of time which ideally cause said first means to produce as a function of time a desired output frequency signal but which actually causes said first means to produce a signal such that error signals are produced by said third means;
wherein the improvement comprises:
sixth means responsive to said error signal from said third means for altering the signal in said fifth means in a sense to reduce said error signal.

4,442,413
TELEVISION RECEIVER PHASE LOCKED LOOP TUNING ARRANGEMENT

Shizuo Hayashida, and Akinori Masuko, both of Saitama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 137,966, Apr. 7, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 423,305
Claims priority, application Japan, Apr. 10, 1979, 54-43345
Int. Cl.³ H03L 7/16
U.S. Cl. 331—1 A **8 Claims**



1. An oscillation frequency control arrangement for a phase-locked loop (PLL) system comprising:
voltage controlled oscillator (VCO) means for providing a VCO signal at a signal output thereof responsive to a control signal;
prescaler means, coupled to said signal output of said VCO means, for prescaling by frequency dividing said VCO signal and providing a prescaled signal at a prescaler output thereof;
programmable frequency divider means, coupled to said prescaler output, for frequency dividing said prescaled signal in accordance with a controllable division ratio in response to a signal coupled to a control terminal thereof and providing a divided signal at a divider output thereof;
reference oscillator means for providing a reference signal;
phase comparator means, coupled to said reference oscillator means and to said programmable frequency divider means, for comparing said divided signal with said reference signal and generating a comparator signal corresponding to a frequency and phase difference between said compared signals;
means, responsive to said comparator signal, for providing the control signal to said VCO;

first frequency division ratio data generating means for generating first frequency division data providing coarse tuning information;

second frequency division ratio data generating means for generating second frequency division data providing fine tuning information;

arithmetic operation means for arithmetically combining said first and second frequency division ratio data and producing third frequency division ratio data for controlling the division ratio of said programmable frequency divider means; and

means for selectively supplying first frequency division ratio data from said first frequency division ratio generating means and third frequency division ratio data from said arithmetic operation means to said control terminal of said programmable frequency divider means.

4,442,414

MAGNETO-OPTICAL PHASE-MODULATING DEVICES

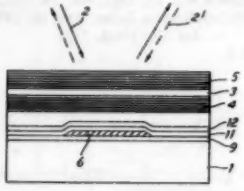
Walter S. Carter, Bracknell, England, assignor to British Aerospace Public Limited Company, London, England

Filed Apr. 17, 1981, Ser. No. 255,027

Claims priority, application United Kingdom, Apr. 29, 1980, 8014087

Int. Cl.³ G02F *1/05*; G02B *5/08*

U.S. Cl. 332—7.51 **14 Claims**



1. A magneto-optical phase-modulating device comprising a magneto-optic layer forming part of an optical stack and upon which, in use, light is incident and to which is applied a reversible magnetic field, a layer of magnetic material adjacent the magneto-optic layer, and at least two flat, low inductance conductors connected in series and disposed one on either side of the layer of magnetic material, in use the conductors having a electric current applied thereto to magnetize the layer of magnetic material, which magnetization is switchable between one direction and the opposite direction by reversing the current in the conductors and which induces an external field of a strength to magnetically affect the magneto-optic layer such that the consequent magnetization thereof is also switched between said one direction and the opposite direction as the field associated with the layer of magnetic material is switched.

4,442,415

MULTICHANNEL FREQUENCY MODULATOR

Shigeaki Ashida, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

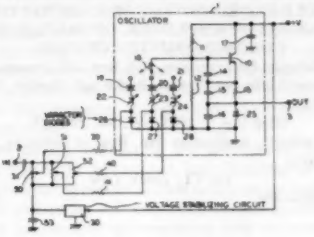
Filed Jul. 14, 1980, Ser. No. 168,583

Claims priority, application Japan, Jul. 20, 1979, 54-99294

Int. Cl.³ H03C *3/22*

U.S. Cl. 332—16 T **16 Claims**

13. An FM modulator-oscillator combination for use in a walkie-talkie, said modulator comprising oscillator means having a plurality of separate oscillating circuits associated therewith, means for biasing each of said oscillating circuits from an individually associated midpoint variable potential terminal on a voltage-dividing resistor, each of said oscillating circuits tuning said oscillator means to a separate carrier wave frequency, a source of modulating signals coupled directly to one end of each of said voltage-dividing resistors, and a stabi-



lized voltage source means coupled directly to the other end of each of said voltage-dividing resistors.

4,442,416

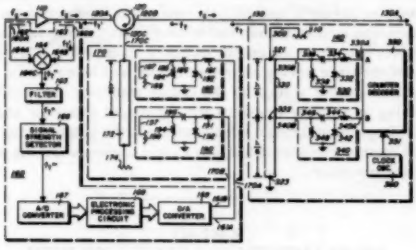
VARIABLE IMPEDANCE SYNTHESIS APPARATUS

Robert L. Epsom, Hanover Park; Paul H. Gailus, Chicago, and Anthony P. van den Heuvel, Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1981, Ser. No. 336,202

Int. Cl.³ H01P *1/00*

U.S. Cl. 333—263 **6 Claims**



1. A variable impedance network for providing a selectably variable input impedance to signals entering a port comprising:

transmission line means, having first and second ends, for conducting radio frequency energy, said first end being said port, said selectably variable input impedance being measurable at said first end, said second end being electrically coupled to a predetermined characteristic impedance;

first variable resistance means, electrically coupled via a first directional coupler to said transmission line means at a first coupling point, for varying the resistance presented to said transmission line means at said first coupling point in response to a first control signal, and

second variable resistance means electrically coupled via a second directional coupler to said transmission line means at a second coupling point, for varying the resistance presented to said transmission line means at said second coupling point in response to a second control signal, said second point being situated between said first point and said characteristic impedance at a sufficient distance from said first point such that signals reflected by said second resistance means are in quadrature relationship with respect to signals reflected by said first resistance means at said first coupling point;

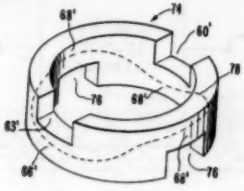
said first and second variable resistance means cooperating to cause different selected input impedances to be presented to signals at said port depending on the value of said

first and second control signals provided to said first and second variable resistance means, respectively.

4,442,417
UNIFORM FIELD SOLENOID MAGNET WITH OPENINGS

Robert S. Symons, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 26, 1982, Ser. No. 342,957
Int. Cl.³ H01F 7/00
U.S. Cl. 335—210 **9 Claims**



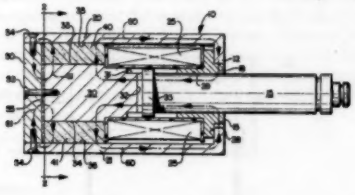
1. A generally solenoidal electromagnet coil for directing a stream of charged particles by a generally uniform magnetic field along the axis of said solenoid, an even number of first regions impeding the flow of coil current spaced circumferentially near one end of said coil whereby said current is forced to divert away from said one end around said first regions,

the improvement wherein being an equal even number of second regions impeding the flow of coil current and diverting it from circumferential flow, said second regions being circumferentially spaced between said first regions and axially removed from said one end.

4,442,418
TRIP SOLENOID

John L. Myers, Tipp City, Ohio, assignor to Ledex, Inc., Vandalia, Ohio

Continuation-in-part of Ser. No. 259,769, May 1, 1981, abandoned. This application Mar. 2, 1983, Ser. No. 471,542
Int. Cl.³ H01F 7/08
U.S. Cl. 335—230 **10 Claims**



1. An improved trip solenoid comprising:

an open frame, having general parallel frame side members and an end,

means in said end defining an opening adapted to receive an armature therethrough,

a coil in said frame defining an annular armature cavity,

an armature received in said frame opening for axial movement and having an inner end received within said coil cavity,

a pole piece mounted in said frame and having a forward portion received in an end of said coil defining a working air gap with said armature and having a rearward portion received exteriorly of said coil and defining a pair of magnet receiving surfaces which are oriented in spaced relation to opposed inside surfaces formed on said frame side members,

a pair of thickness oriented magnets, one each received in each of the spaces between said pole surfaces and the adjacent surfaces of said frame members and in contact therebetween for providing an initial holding force tending to retain said armature adjacent said pole piece, and

closure plate means receiving in the end of said frame in magnetic contact with said frame members and in spaced relation to said pole piece forming a secondary flux path, through which a major portion of the flux of the coil may pass when energized.

4,442,419
STATIC INDUCTION APPARATUS

Minoru Kanoi, Ibaraki; Yasuro Hori, Katsuta, and Masaaki Maejima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,868
Claims priority, application Japan, Sep. 30, 1980, 55-136879
Int. Cl.³ H01F 15/00
U.S. Cl. 336—100 **6 Claims**

1. A static induction apparatus comprising:

a vessel containing a main body of said static induction apparatus;

a plurality of reinforcing support members secured to a side plate of said vessel; and

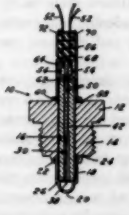
sound reducing means supported between said reinforcing support members;

said sound reducing means including a sound insulating panel composed of a high damping metal plate formed of a plurality of thin metal sheets having a layer of viscoelastic material interposed between adjacent metal sheets, a resilient plate formed of a thin metal sheet material interposed between said sound insulating panel and said reinforcing support members, and a weight member disposed only about an outer peripheral portion of the sound insulating panel and secured to the sound insulating panel only in an area of a boundary between said sound insulating panel and said resilient plate.

4,442,420
PARTIAL PRESSURE OF OXYGEN SENSOR-II

Robert F. Novak, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,413
Int. Cl.³ H01L 7/00
U.S. Cl. 338—34 **5 Claims**



1. A partial pressure of oxygen sensor for insertion into an

exhaust system of a hydrocarbon fuel burning device, comprising in combination:

a mounting body formed of a metallic material threaded on one end for securement to the exhaust system and having a cylindrical configured bore of a first diameter extending along a central axis thereof;

a first protection tube having an opening therein secured to said threaded end of said mounting body, said first protection tube having a stepped shoulder therein having an internal diameter smaller than said first diameter of said cylindrical bore;

a heated sensing element including: a ceramic support of generally rectangular cross section, a resistance heater element bonded to a leading portion of said ceramic support, a titania dioxide sensing element, and a sensing element supporting wire upon which said titania dioxide sensing element is supported in a location in juxtaposition to said leading portion of said ceramic support so that said resistance heater heats said sensor element to a required temperature when a preselected voltage is applied across said resistance heater element;

an insulator body of ceramic material, said insulating body having a shape of a right cylinder with a diameter slightly less than said first diameter of said cylindrical configured bore, said insulator body having a slotted opening for receiving said heated sensing element therein with said titania dioxide sensing element of said heated sensing element projecting beyond a leading portion of said insulator body, said insulator body receiving said heated sensing element therein being received in said cylindrical configured bore of said mounting body in a manner such that, said leading portion of said insulator body extends beyond said cylindrical bore to engage said stepped shoulder of said first protection tube, said first protection tube protecting said leading portion of said heated sensing element, said opening of said first protection tube permitting exhaust gases to flow into contact with said heated sensing element;

a plurality of fine electrical lead lines, a pair of said fine lead lines being bonded to and extending from said resistance heater element and a pair of said fine lead lines also bonded to and extending from said sensing element supporting wire;

a plurality of electrical lead lines equal in number to said fine electrical lead lines;

a plurality of crimped bands, each of said crimped bands interconnecting paired ones of said electrical lead lines and said fine electrical lines;

a second ceramic insulator body having a plurality of passageways therein equal in number to said plurality of said crimped bands, said passageways being so constructed and arranged that each of said passageways has an associated pair of said interconnected leads passing therethrough with said crimped band interconnecting the same coming into locating engagement with the side walls defining said associated passageway;

a second protection tube means having one end secured to an end of said mounting body not having said threads thereon for enclosing and protecting said second ceramic insulator body and elements received therein and passing therethrough;

a ceramic cement occupying a volume between said second ceramic insulator body and a rear portion of said insulator body and heated sensing element received therein;

a high temperature resistant sealant material occupying a volume between said second ceramic insulator body and a free end of said second protection tube means; and

electrical terminal means connected to said plurality of electrical lead lines for independently connecting said lead lines as required to a source of voltage and to a sensing circuit.

4,442,421

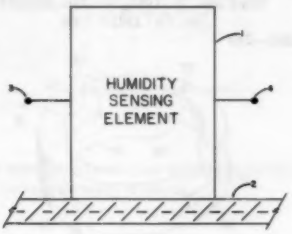
SEMICONDUCTING COORDINATION POLYMERS AND ELECTRICAL APPLICATIONS THEREOF

Otha J. Jacobus, 917 Marlene Dr., Gretna, La. 70053, and Donald R. Owen, 8418 Sycamore St., New Orleans, La. 70118

Filed Jul. 31, 1981, Ser. No. 288,884

Int. Cl.³ H01L 7/00

U.S. Cl. 338—35 **5 Claims**



1. A humidity sensing detector, comprising:

a semiconducting, oxidized coordination polymer, humidity sensing element prepared from a polydentate organic ligand and a metal salt; and

electrical contacts at spaced locations on said sensing element.

4,442,422

HUMIDITY SENSITIVE RESISTOR

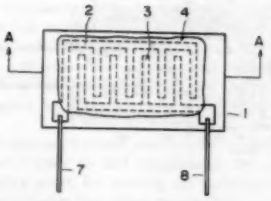
Michihiro Murata, Kyoto; Shoichi Kitao, Otokuni, and Shinsei Okabe, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 21, 1983, Ser. No. 477,408

Claims priority, application Japan, Mar. 31, 1982, 57-54569; Nov. 22, 1982, 57-204778

Int. Cl.³ H01L 7/00

U.S. Cl. 338—35 **3 Claims**



1. A humidity sensitive resistor, comprising:

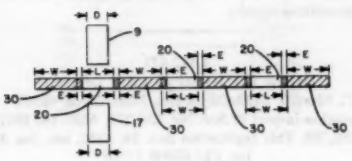
a pair of detecting electrodes (2, 3) formed on an insulating substrate (1); and

a humidity sensitive film (4) formed by coating on the detecting electrodes, said humidity sensitive film being formed of an integrated structure of a first layer macromolecular resin film (5) containing a polyvinyl alcohol polymer and an electrolyte and a second layer of hygroscopic macromolecular resin film (6) coating on said first layer macromolecular resin film (5), said humidity sensitive resistor being characterized in that the water absorbing rate of the second layer high molecular resin film (6) by moisture absorption is smaller than that of the first layer macromolecular resin film (5).

4,442,423
OPTICAL POSITION SENSOR INCLUDING A SPECIALLY DESIGNED ENCODER PLATE

Peter J. Urbanik, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 8, 1982, Ser. No. 337,909
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 P 5 Claims



1. An optical position sensor comprising:
an optical transmitter for transmitting a substantially constant amplitude light signal;
an optical receiver for receiving the light signal transmitted by the optical transmitter and for generating an output light signal in response thereto;
a digital switching device for monitoring the optical output light signal at the receiver and for generating a high level output signal when the monitored light signal exceeds a threshhold level which is set at less than one-half of the designed maximum output light signal amplitude at the receiver; and
an encoder plate located between the optical transmitter and the optical receiver for modulating the light transmissions from the transmitter to the receiver as a function of plate position, said encoder plate having at least one information channel having a linear series of alternating apertures and opaque sections with each aperture having a length, L, given by:

$$L=(I+2T)D$$

where,
I=a selected positive integer which may vary from row to row depending on the code pattern which it is desired to establish on the plate
T=the ratio, which is less than one-half, of the preset threshhold level of the digital switching device to the designed maximum output light signal amplitude at the receiver, and
D=the beam width of the transmitted signal from the optical transmitter
and with each opaque section having a length, OP, given by:

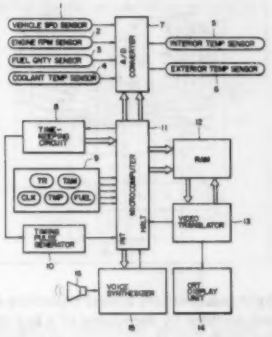
$$OP=2(I+1)D-L$$

whereby a symmetrical digital output signal is generated as a function of encoder plate position for each information channel having such apertures and opaque sections.

4,442,424
METHOD AND SYSTEM FOR DISPLAYING VEHICLE OPERATING PARAMETERS IN A VARIABLE FORMAT

Shinji Shirasaki, Kariya; Yoshihiko Tsuzuki, Anjyo; Yuzi Hirabayashi, Aichi; Hiroshi Okazaki, Okazaki; Masahiro Matsuyama, Kariya; Masanobu Kobayashi, Kariya, and Yoji Ito, Kariya, all of Japan, assignors to Nippondenso Company, Limited, Kariya, Japan

Filed Jun. 9, 1981, Ser. No. 271,936
Claims priority, application Japan, Jun. 11, 1980, 55-79298; Aug. 21, 1980, 55-115695
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—52 F 17 Claims



1. A method for displaying the operating parameters of a plurality of parts of a motor vehicle on a viewing screen, comprising the steps of:
(a) constantly monitoring said operating parameters;
(b) displaying the magnitudes of said monitored operating parameters as indication items in respective formats on said viewing screen;
(c) detecting one or more of said monitored parameters which are abnormal;
(d) deleting a portion of the displayed indication items excepting the item whose monitored parameter is detected as being abnormal; and
(e) enlarging the displayed item whose monitored parameter is detected as being abnormal over an area including the area in which said portion has been displayed.

4,442,425
PASSIVE FIBER OPTIC KEYBOARD

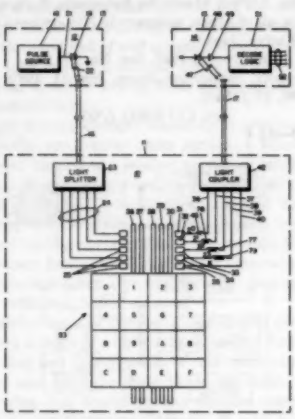
Jules A. Elbner, Maple Glen, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 13, 1981, Ser. No. 321,009
Int. Cl.³ G06F *3/02*; G08C *9/00*
U.S. Cl. 340—365 S 11 Claims

1. An electrically inert keyboard apparatus, comprising:
a plurality of keys arranged in the form of a keyboard,
actuating bar means connected to each of said keys,
shutter means operated by said actuating bar means,
light pulse source means,
fiber optic projection means coupled to said light pulse source means and arranged in parallel juxtaposed one side of said shutter means,
fiber optic collector means arranged in parallel juxtaposed the other side of said shutter means for receiving said light pulses in parallel from said projection means,
said collector means comprising a plurality of optical collectors each coupled to individual output fiber optic cables,
coupling means for logic OR gating said individual output fiber optic cables into a single output fiber optic cable,
delay means connected intermediate said light pulse source

means and said coupling means in one of said fiber optic means, and

decoding logic means coupled to said single output fiber optic cable for detecting the absence or presence of sev-



eral light pulses at said optical collectors when said shutters are actuated by depression of a key of said keyboard and for producing electrical signals indicative of said key being depressed.

4,442,426

SIGNAL TRANSMISSION

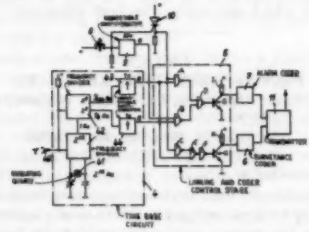
Herr F. Heuschmann, Munich, and Herr A. Plank, Kolbermoor, both of Fed. Rep. of Germany, assignors to Compur-Electronic GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 4,243, Jan. 17, 1979, abandoned. This application Feb. 4, 1981, Ser. No. 231,548

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2802075

Int. Cl.³ G08B *1/08*; H04Q *7/00*

U.S. Cl. 340—539 **16 Claims**



1. A security and monitoring method in a wireless information system which includes receiving means and plural separate transmitting means, comprising the steps of:

transmitting from each of said plural and separate transmitting means to said receiving means a monitoring signal of predetermined duration at a fixed repetition rate, the period of said repetition rate being an integer multiple of a first fixed interval of time;

synchronizing said plural transmitting means to transmit said respective monitoring signals so that any two successive said monitoring signals transmitted by respective said transmitting means are spaced in time by a respective delay interval which is an integer multiple of said first fixed interval of time; and

sending alarm signals separate from said monitoring signals and of predetermined duration to said receiving means, each said alarm signal being transmitted during a respective said delay interval and at a point in time spaced a second fixed interval of time after transmission of a respective said monitoring signal by a respective said transmitting means;

whereby said monitoring and alarm signals are transmitted by said plural transmitting means according to a rigid timing schedule and all said monitoring signals and said alarm signals of each said transmitting means are free of interference with said monitoring signals of other of said transmitting means.

4,442,427

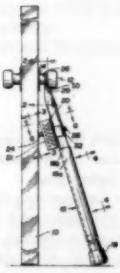
DOOR LOCKING ALARM DEVICE

David C. Morton, 3152 Curtis Dr., Flint, Mich. 48507

Continuation-in-part of Ser. No. 244,294, Mar. 16, 1981, Pat. No. 4,358,758. This application Jun. 24, 1982, Ser. No. 391,531

Int. Cl.³ G08B *13/08*

U.S. Cl. 340—546 **10 Claims**



1. A door locking and alarm device for portable use and ready installation on a door handle comprising:

an adjustable length shaft portion;

a non-skid end portion mounted on the lower end of the shaft portion;

a door handle engaging end fixed to the upper end of said shaft portion and mounted on it substantially aligned to its longitudinal axis; and

an alarm device slidably mounted on said shaft portion and having an actuator therefor movable away from and toward abutment with the inner surface to the door for providing an alarm responsive to a limited movement of the door inwardly.

4,442,428

COMPOSITE VIDEO COLOR SIGNAL GENERATION FROM DIGITAL COLOR SIGNALS

Mark E. Dean, Boynton Beach; David A. Kummer, Boca Raton, and Jesus A. Saenz, Coral Springs, all of Fla., assignors to IBM Corporation, Armonk, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,074

Int. Cl.³ G09G *1/28*

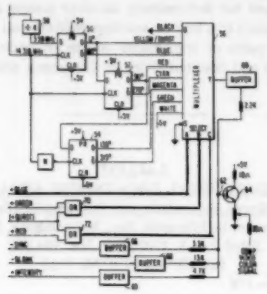
U.S. Cl. 340—703 **4 Claims**

1. A composite video color signal-generating circuit for generating a composite video color signal compatible with a television receiver designed according to the NTSC color system comprising:

means for providing a 3.58 MHz wave reference color subcarrier signal;

digital phase-shifting means for digitally converting said subcarrier signal into a plurality of individual phase-shifted subcarrier signals of identical frequency simulta-

neously present on corresponding individual output lines, each individual signal having a different predetermined phase shift relative to said reference subcarrier signal, and each phase shift representing a different color; and



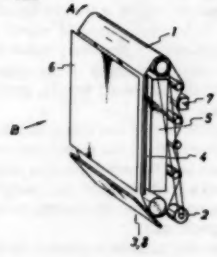
multiplexer means having inputs coupled to respective ones of said output lines, and responsive to coded digital signals, representing different desired colors, for selectively switching to an output terminal of said multiplexer means individual ones of the phase-shifted subcarrier signals in accordance with the coded digital signals.

4,442,429

DISPLAY APPARATUS UTILIZING A THERMALLY COLOR REVERSIBLE DISPLAY MEDIUM WHICH HAS A HYSTERESIS EFFECT

Shintaro Kotani; Ichimatsu Abiko; Takashi Arae; Mio Chiba; Tomoo Araki, and Hiromasa Kanno, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1981, Ser. No. 301,598
Int. Cl.³ G09G 3/22
U.S. Cl. 340—786 **7 Claims**



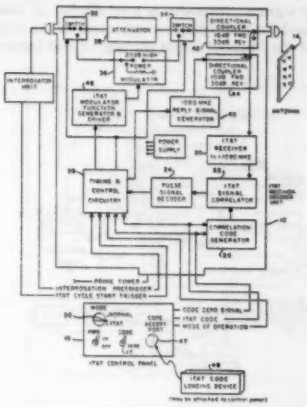
1. A display apparatus comprising a heat-sensitive medium of an endless, broad-width belt-like shape having a hysteresis effect between the temperature and color, driving means for rotating and transferring said heat-sensitive display medium, a first heating member comrpising a plurality of heating elements aligned in the lateral direction of the heat-sensitive display medium, a plane transparent panel heater located on the back of the display surface contiguously to the heat-sensitive display medium, lighting means disposed on the back of the transparent heat-insulating member to illuminate the display surface, a color filter disposed in front of the display surface, and cooling means for cooling the heat-sensitive display medium after display, and a second heating member disposed in the passage of the heat-sensitive display medium between the transparent panel heater and the cooling means, the entire heat-sensitive medium being uniformly discolored by said second heating member to erase said information recorded on the heat-sensitive display medium.

4,442,430

IDENTIFICATION TECHNIQUE FOR AIR TRAFFIC

Bernard A. Schneider, 8984 Bellefontaine Rd., Dayton, Ohio 45424

Filed May 11, 1981, Ser. No. 262,713
Int. Cl.³ G01S 13/78
U.S. Cl. 343—6.5 R **5 Claims**



1. In an interrogator-transponder beacon system having an interrogator cooperating with an antenna and a transponder cooperating with an antenna, the improvement comprising an identification technique (ITAT) comprising an interrogator add-on unit coupled between the interrogator and its antenna, and a transponder add-on unit coupled between the transponder and its antenna;

wherein said interrogator add-on unit comprises control means including means to manually select either a normal mode of operation or an ITAT mode; apparatus effective during the ITAT mode which includes means to add special modulation to an interrogator output radio frequency signal, and means to pass the interrogator signal with said special modulation to the interrogator antenna; wherein said transponder add-on unit includes control means to select either a normal mode or an ITAT mode, and apparatus effective during the ITAT mode which includes means to route the interrogation signal received at the transponder unit to an ITAT receiver, means to detect the ITAT information, means to generate a normal interrogation which is forwarded to the transponder, which in a normal manner generates a reply, means to add special modulation to the transponder output radio frequency signal, and means to pass the transponder signal with said special modulation to the transponder antenna; wherein said interrogator add-on unit further includes means to route the transponder reply received at the interrogator antenna to an ITAT receiver, means to detect the ITAT information, and means to generate a normal transponder reply which is forwarded to the interrogator.

4,442,431

AIRBORNE MISSILE GUIDANCE SYSTEM

William M. Bleakney, Sherman Oaks, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jul. 12, 1971, Ser. No. 163,535
Int. Cl.³ F41G 7/28
U.S. Cl. 343—7 ED **5 Claims**

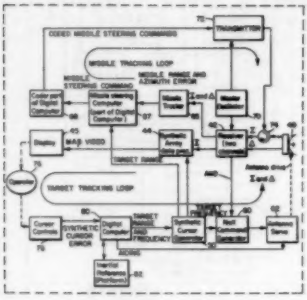
1. A system for guiding a remotely controllable missile along a flight path towards a designated target area, said system comprising:

radar means for transmitting energy to and receiving energy from a selected area of terrain, said radar means including

a monopulse antenna having a pattern with a null plane in the azimuth dimension;

cursor generator means, including manual control circuitry, for providing cursor signals indicative of the relative range and doppler frequency of a selected target portion in said terrain area as designated by the manual control circuitry;

display means responsive to said received energy and to said cursor signals presenting a map display of said selected area; and for presenting an indication of the relative position of the selected target portion of said terrain area;



null command generator means for measuring the relative doppler frequency of energy received along said null plane and for positioning said antenna such that the relative doppler frequency of said null plane energy is substantially the same as the doppler frequency of said cursor signal;

means for sensing the position of said missile in said pattern and for remotely controlling said missile so that its flight path is substantially along said azimuth null plane.

4,442,432

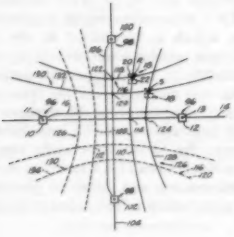
ELECTRONIC NAVIGATION METHOD AND SYSTEM

William L. Quigley, 3280 E. Fairpoint St., Pasadena, Calif. 91107

Continuation of Ser. No. 96,629, Nov. 23, 1979. This application Sep. 17, 1981, Ser. No. 302,966

Int. Cl.³ G01S *1/30, 3/02*

U.S. Cl. 343—394 **28 Claims**



1. A navigation system, comprising,

frequency standard means for generating at least one frequency standard signal,

transmitter means comprising at least three transmitters arranged in pairs, each of said transmitters fixed in location relative to the others and transmitting a navigation signal,

link means for supplying at least one frequency standard signal to each transmitter of said transmitter means for providing each transmitter with an excitation signal, each transmitter being responsive to the applied excitation signal for establishing the frequency of the navigational signal transmitted therefrom, and

receiver means responsive to the navigation signals for detecting and counting Doppler frequency shifts in said navigation signals separately from pairs of the transmitter means and for determining receiver means displacement with respect to a known starting position and with respect to said pairs of transmitter means in accordance with detected and counted Doppler frequency shifts.

4,442,433

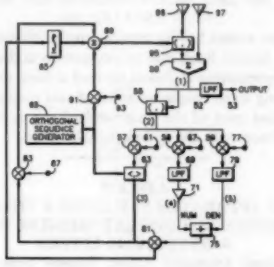
ADAPTIVE SIGNAL PROCESSING APPARATUS

Michael H. Myers, Scottsdale, and Sam Daniel, Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jul. 1, 1982, Ser. No. 394,082

Int. Cl.³ G01S *3/16, 3/28*

U.S. Cl. 343—378 **9 Claims**



1. Adaptive signal processing apparatus for a signal array including a main input and a plurality of secondary inputs, said apparatus comprising:

first means coupled to receive a weight signal, a gradient signal and an orthogonal sequence signal and further coupled to the plurality of secondary inputs for dithering input signals from the plurality of secondary inputs in accordance with the combined weight, gradient and orthogonal sequence signals;

second means coupled to said first means and the main input for combining signals from the main input with the dithered input signals and for developing an output signal, a weight signal and a gradient signal, said weight and gradient signals being coupled to said first means for supplying the dithering signals; and

an orthogonal sequence generator coupled to said first and second means for supplying a portion of the dithering signal and for use in developing the gradient signal.

4,442,434

ANTENNA CIRCUIT OF THE NEGATIVE IMPEDANCE TYPE

Knud E. Baekgaard, Struer, Denmark, assignor to Bang & Olufsen A/S, Struer, Denmark

Filed Mar. 13, 1981, Ser. No. 243,623

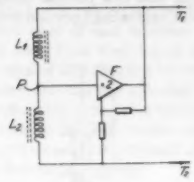
Claims priority, application Denmark, Mar. 13, 1980, 1070/80

Int. Cl.³ H01Q *1/26, 7/06*

U.S. Cl. 343—701 **9 Claims**

1. An aerial circuit comprising a main antenna and a negative impedance means for producing a broad effective frequency range of the aerial circuit the negative impedance means comprising an amplifier and a frequency dependent impedance

imitating an impedance of the main antenna and seeking to eliminate the same through the amplifier, characterized in that



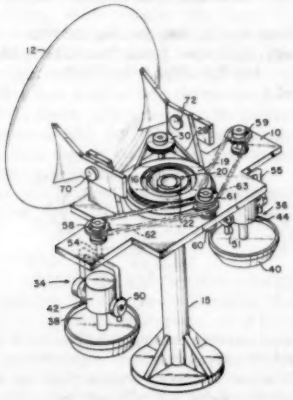
the frequency dependent impedance is constituted by an auxiliary antenna of a similar type as the main antenna.

4,442,435

GYRO STABILIZATION PLATFORM FOR SCANNING ANTENNA

Rikio Kiryu, Yokohama, and Takeshi Bessho, Hachioji, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 269,953, Jun. 3, 1981, abandoned. This application Jan. 8, 1982, Ser. No. 337,971
Claims priority, application Japan, Jun. 3, 1980, 55-73710
Int. Cl.³ H01Q *1/34, 1/18*
U.S. Cl. 343—709 **10 Claims**



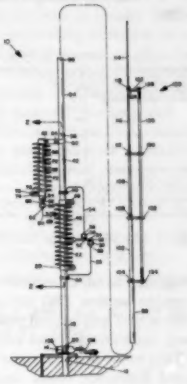
1. A passive stabilization system comprising;
a fixed stand;
gimbal means associated with said stand;
a platform pivotally mounted on said stand by said gimbal means;
at least two gyros, each including a flywheel and a drive motor for said flywheel;
at least two suspension means suspending respective ones of said gyros from said platform and having a gyro azimuth axis normal to said platform, said at least two gyros being mounted pivotally about respective gyro support axes which are perpendicular to one another; and
gyro azimuth drive means for driving said at least two suspension means about their individual gyro azimuth axes while maintaining the individual axes in their relative angular relationship in response to azimuthal movement of said platform.

4,442,436

VERTICAL ANTENNA

Donald R. Newcomb, Rte. 2, Box 356E, San Marcos, Tex. 78666

Filed Nov. 16, 1981, Ser. No. 321,548
Int. Cl.³ H01Q *9/14, 9/18*
U.S. Cl. 343—722 **7 Claims**



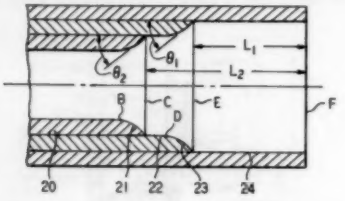
1. Vertical antenna resonating on six predetermined segments of the high-frequency spectrum comprising:
a. first inductor-capacitor means vertically supported and comprising an eighty/seventy-five meter section including an eighty/seventy-five meter inductor and capacitor connected in parallel across the top of said section, said inductor adjusting the center frequency of operation;
b. second inductor-capacitor means vertically connected to said first inductor-capacitor means and comprising a forty-meter section including a forty-meter inductor and capacitor connected in parallel across the top of said section, said inductor adjusting the center frequency of operation, and said inductors and capacitors connecting at a common point on an insulator between said sections;
c. vertical radiating means connected to said second inductor-capacitor means by an insulator post, said vertical radiating means comprising first, second, third, fourth, fifth, and sixth vertical radiating sectional elements secured to each of the other respective elements;
d. third inductor-capacitor means vertically supported and comprising a thirty-meter inductor and capacitor connected in series between said forty-meter inductor and said vertical radiating element;
e. stub means connected to a top portion of said vertical radiating means, spaced a fraction of a wavelength therefrom and extending parallel downwardly therefrom, said stub means substantially one-quarter wavelength of fifteen meters; and,
f. an impedance matching coil connected across said first inductor-capacitor means and ground, a coaxial cable transmission line impedance matching section connected across said impedance matching coil, and said vertical antenna having a height in the range of twenty-five to twenty-six feet whereby a coaxial cable transmission line connected to said first inductor-capacitor means and ground, and the entire vertical radiating length of said vertical antenna is active on five of said six high-frequency spectrum segments and said stub means decouples said vertical radiating means above said stub means thereby yielding a quarter wave vertical radiating means on the frequency corresponding to the length of said stub means.

4,442,437

SMALL DUAL FREQUENCY BAND, DUAL-MODE FEEDHORN

Ta-Shing Chu, Lincroft, and Robert W. England, Piscataway, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 25, 1982, Ser. No. 342,058
Int. Cl.³ H01Q 13/06
U.S. Cl. 343—786 4 Claims



1. A dual frequency band, dual-mode feedhorn comprising:
a first waveguide section (20) comprising a longitudinal passage with a first and second port at a first and second end thereof, respectively, and capable of supporting a dominant TE_{11} mode of a first and a second signal in a first and a second frequency band, respectively, propagating therein;
a second waveguide section (22) comprising a longitudinal passage, which is larger in cross-section than the longitudinal passage of the first waveguide section, with a first and a second port at a first and a second end thereof, respectively, and capable of supporting the TE_{11} mode of said first and second frequency bands and only the TM_{11} mode of a higher one of the two frequency bands;
a first discontinuity (21) connecting the second port of the first waveguide section with the first port of the second waveguide section and capable of converting a portion of the TE_{11} mode in both frequency bands into TM_{11} mode energy;
a third waveguide section (24) comprising a longitudinal passage, which is larger in cross-section than the longitudinal passage of the second waveguide section, with a first and a second port at a first and a second end thereof, respectively, and capable of supporting the TE_{11} and TM_{11} mode in said first and second frequency bands, said second and third waveguide sections comprising a longitudinal length such that the vector sum of the associated TE_{11} and TM_{11} mode components in each of the frequency bands are all substantially in phase at the second port of the third waveguide section; and
a second discontinuity (23) connecting the second port of the second waveguide section with the first port of the third waveguide section and capable of converting a portion of the TM_{11} mode in both frequency bands into TM_{11} mode energy.

4,442,438

HELICAL ANTENNA STRUCTURE CAPABLE OF RESONATING AT TWO DIFFERENT FREQUENCIES

Kazimierz Siwiak, Sunrise; Oscar M. Garay, North Lauderdale, and Quirino Balzano, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 29, 1982, Ser. No. 363,186
Int. Cl.³ H01Q 1/36
U.S. Cl. 343—792 8 Claims

1. An antenna exhibiting first and second different predetermined resonant frequencies comprising:
a first helically configured electrically conductive element;
a second helically configured electrically conductive element, said first and second elements being coupled to a common feed port so as to together resonate at said first predetermined resonant frequency when radio frequency energy is supplied to said feed port, and
a first electrically conductive member including first and second portions, said first portion being situated within said first element, said second portion being situated exter-

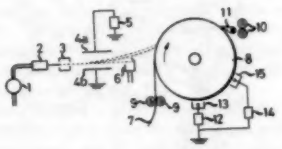
nal to said first element and extending from said first portion, said first member being coupled to said feed port and said first element such that said first member and said first element together resonate at said second predetermined resonant frequency when radio frequency energy is supplied to said feed port.

4,442,439

INK JET PRINTING APPARATUS

Akinori Mizuno, Yokohama, Japan, assignor to Ricoh Co. Ltd., Japan

Filed Nov. 3, 1980, Ser. No. 203,542
Claims priority, application Japan, Nov. 8, 1979, 54-144660
Int. Cl.³ G01D 9/00, 15/18
U.S. Cl. 346—1.1 23 Claims



2. A method of reducing printing distortion in ink jet printing, wherein the ink jet is ejected from an ejection head, breaks into drops which are charged by a signal electrode in accordance with a printing signal and deflected before they strike a recording medium, comprising the steps of:
charging a record medium conveyor member with a charge of an inverse polarity to the charge applied to the ink drops by the signal electrode; and
conveying the record medium on the record medium conveying member to a position where the record medium receives the ejected charged ink drops.

4,442,440

INK JET GUTTER METHOD AND APPARATUS

Gilbert M. Elchinger, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 5, 1982, Ser. No. 365,123
Int. Cl.³ G01D 18/00, 15/18
U.S. Cl. 346—1.1 12 Claims

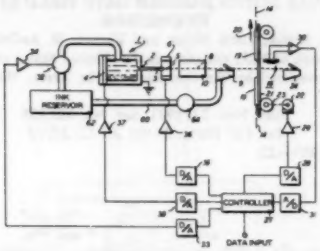
4. A method for recirculating ink from a droplet generator in a continuous ink jet printing system through an ink processing

station and back to said droplet generator comprising the steps of:

forcing one or more ink streams under pressure through an orifice to produce one or more discrete droplet streams traveling along a path toward a recording medium;

deflecting certain ones of said droplets from said one or more streams away from their initial trajectory to allow only certain ones of said droplets to strike said medium;

intercepting those droplets not intended to strike said recording medium with a receiving structure having a cavity therein with an opening thereto through which the droplets enter the cavity, the internal surface of said cavity having a first surface energy;



connecting a supporting structure to said receiving structure, the supporting structure being below said receiving structure and having a passageway therethrough, the internal surface of said passageway having a second surface energy which is higher than that of the first surface energy and having one edge abutting an edge of the internal surface of the receiving structure to form a boundary therebetween, so that the guttered ink in the vicinity of the boundary is pulled from the receiving structure cavity with the lower surface energy to the supporting structure passageway with the higher surface energy by capillary attraction, thereby avoiding ink buildup in the receiving structure cavity; and

moving said guttered ink through subsequent processing steps and back to the droplet generator.

4,442,441

MAGNETIC RECORDING DEVICE

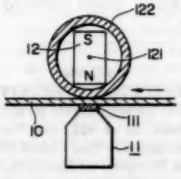
Yoshiki Kikuchi; Takashi Omori; Haruhiko Moriguchi; Fujio Moriguchi, and Tomio Murayama, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1981, Ser. No. 235,366

Claims priority, application Japan, Feb. 19, 1980, 55-18472; Feb. 19, 1980, 55-18473; Feb. 19, 1980, 55-18474; Feb. 19, 1980, 55-19140[U]

Int. Cl.³ G01D *15/12*

U.S. Cl. 346—74.4 **10 Claims**



1. A magnetic recording device comprising:

a magnetic medium having an initial uniform magnetization pattern in which desired portions are selectively magnetized in a latent image pattern;

a thermal printing head having a supporting substrate and a plurality of heat generating elements arranged on said supporting substrate, said magnetic medium moving relative to said thermal printing head;

means for supplying heating current selectively to said heat generating elements according to data to be recorded so that said magnetic medium is locally heated by selected ones of said heat generating elements to a temperature greater than the Curie temperature of said magnetic medium as it moves relative to said thermal printing head;

a confronting roll disposed confronting said thermal printing head through said magnetic medium; and

a biasing magnet provided inside said confronting roll for applying a biasing magnetic field to predetermined portions of said magnetic medium which are heated.

4,442,442

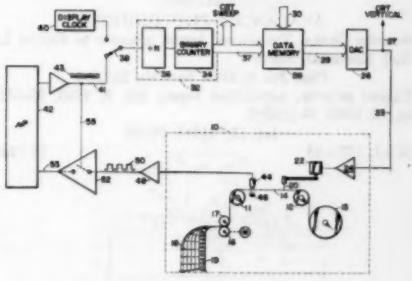
DATA SYNCHRONIZATION SYSTEM FOR GRAPHIC RECORDING APPARATUS

Gary B. O'Dell, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 5, 1982, Ser. No. 337,197

Int. Cl.³ G01G *15/14*

U.S. Cl. 346—136 **4 Claims**



1. A system for recording graphic image information, stored in digital form, on a moving record medium, comprising:

storage means for storing digital signals representative of an image to be recorded,

digital-to-analog converter means for converting digital signals read out from the storage means into corresponding analog signals,

recording means for transcribing analog signals on a moving record medium,

means for producing a pulse train having a repetition frequency proportional to the travel rate of the moving medium,

means for determining the period of the pulse train, and

means for supplying digital signals from the storage means to the recording means by way of the converter means at a rate dependent on the period of the pulse train.

4,442,443

APPARATUS AND METHOD TO EJECT INK DROPLETS ON DEMAND

John G. Martner, Brookfield, Conn., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 18, 1982, Ser. No. 389,785

Int. Cl.³ G01D *15/18*

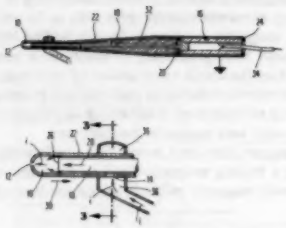
U.S. Cl. 346—140 R **18 Claims**

1. An ink jet apparatus comprising:

an ink jet chamber including a droplet ejection orifice and an ink supply inlet;

transducer means capable of displacement in different directions; and

coupling means coupled between said transducer means and said chamber, said coupling means coupling displacement of said transducer in one of said directions to said chamber



so as to produce a first change of volume of said chamber and coupling displacement of said transducer in another of said directions to said chamber so as to produce a second change in volume of said chamber such that displacement of said transducer in different directions are additive in producing a change in volume of said chamber.

4,442,444

AVALANCHE PHOTODIODES

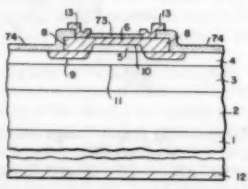
Fukunobu Osaka, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 8, 1981, Ser. No. 281,304

Claims priority, application Japan, Jul. 8, 1980, 55-93025; Aug. 28, 1980, 55-118592

Int. Cl.³ H01L *29/90*

U.S. Cl. 357—13 **15 Claims**



1. An avalanche photodiode comprising:

a light absorbing semiconductor layer comprising a first semiconductor material having a first band gap and doped with a first conductivity type impurity to a first concentration;

a first window semiconductor layer formed on said light absorbing semiconductor layer, comprising a semiconductor material having a larger band gap than said first band gap, and doped with the first conductivity type imprurity to a second concentration at least as high as said first concentration;

a second window semiconductor layer having an outer perimeter, formed on a predetermined portion of said first window semiconductor layer, comprising the same semiconductor material as that of said first window layer, doped with the first conductivity type impruity to a concentration higher than said second concentration;

a first region of said second window semiconductor layer being of highly doped with a second conductivity type impurity to a third concentration higher than said second concentration, said first region providing a p-n junction for avalanche multiplication and a light sensitive region;

a second region of said second window semiconductor layer adjacent to said first region, and a top region of said first window layer surrounding said outer perimeter of said second widow semiconductor layer, both said second region and said top region being highly doped with the second conductivity type impurity to a concentration higher than said second concentration, said second region being doped to a first depth above the junction between said light absorbing layer and said first window layer and said top region being doped to a second depth above the junction between said light absorbing layer and said first window layer, said second region and said top region forming a p-n junction guard ring effect.

4,442,445

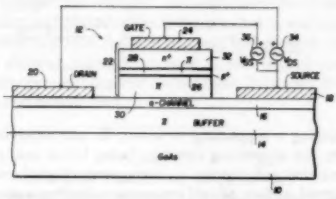
PLANAR DOPED BARRIER GATE FIELD EFFECT TRANSISTOR

Roger J. Malik, Little Silver, and Thomas R. AuCoin, Ocean City, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 23, 1981, Ser. No. 323,858

Int. Cl.³ H01L *29/80, 29/12, 27/12*

U.S. Cl. 357—22 **14 Claims**



1. A three terminal epitaxial layer field effect semiconductor device comprising in combination:

a substrate of semiconductor material;

a planar channel region of semiconductor material of a first predetermined type formed on said substrate and being adapted to operate as a lateral conductive channel for charge carriers associated with said predetermined type;

first and second charge carrier terminal means providing respective source and drain electrodes located on said planar region of said semiconductor material in spaced apart relationship; and

control terminal means located intermediate said first and second terminal means for controlling the lateral flow of said charge carriers between said first and second terminal means through said planar channel region, said control terminal means including a planar doped barrier gate layered structure having a pair of substantially undoped planar regions one of which is contiguous to said planar channel region, a relatively thin planar region of highly doped semiconductor material of a second predetermined type positioned between said pair of undoped regions, an outer planar region of highly doped semiconductor material of said first type contiguous to the other of said pair of substantially undoped planar regions, and a gate electrode on said outer region spaced vertically from said planar channel region.

4,442,446

SENSITIZED EPITAXIAL INFRARED DETECTOR

Alan C. Bouley, Silver Spring; Harold R. Riedl, Adelphi; James D. Jensen, Highland, all of Md., and Steven R. Jost, Baldwinsville, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 17, 1982, Ser. No. 358,941

Int. Cl.³ H01L *27/14, 33/00, 29/167, 23/48*

U.S. Cl. 357—30 **4 Claims**

1. In an infrared sensitive diode comprising:

(1) an infrared transparent, electrically insulating single

crystal substrate composed of a material selected from the group consisting of (a) akali halides and (b) alkaline earth halides;

(2) an epitaxial layer of a semiconductor alloy material selected from the grup consisting of PbS, PbSe, PbTe, PbS_xSe_{1-x}, PbS_xTe_{1-x}, $PbSe_xTe_{1-x}$, $Pb_ySn_{1-y}S$, $Pb_ySn_{1-y}Se$, $Pb_ySn_{1-y}Te$, $Pb_ySn_{1-y}S_xSe_{1-x}$, $Pb_ySn_{1-y}S_xTe_{1-x}$, $Pb_ySn_{1-y}Se_xTe_{1-x}$, $Pb_zCd_{1-z}S$, $Pb_zCd_{1-z}Se$, $Pb_zCd_{1-z}Te$, $Pb_zCd_{1-z}S_xSe_{1-x}$, $Pb_zCd_{1-z}S_xTe_{1-x}$, and $Pb_zCd_{1-z}Se_xTe_{1-x}$, wherein $0<x<1$, $0<y<1$ and $0<z<1$, wherein the epitaxial layer

of semiconductor material covers at least a portion of the substrate;

(3) a non-Ohmic Pb metal contact deposited on the epitaxial layer to form a Schottky barrier junction; and

(4) an Ohmic contact deposited on the epitaxial layer of the semiconductor material;

the improvement comprising: the inclusion of halide ions selected from the group consisting of chloride ions, bromide ions, fluoride ions, and mixtures thereof at the interface between the non-Ohmic Pb metal contact and the epitaxial layer of semiconductor alloy material.

4,442,447

ELECTRICALLY ALTERABLE NONVOLATILE FLOATING GATE MEMORY DEVICE

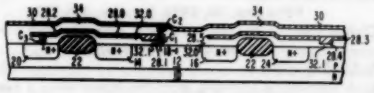
Alfred C. Ipri, Princeton, and Roger G. Stewart, Neshanic Station, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,636

Claims priority, application United Kingdom, Mar. 9, 1982, 8206906

Int. Cl.³ H01L *27/02, 29/78;* **G11C** *11/40*

U.S. Cl. 357—41 **6 Claims**



1. An array of nonvolatile floating gate memory devices arranged in rows and columns in a body of semiconductor material of a first conductivity type, alternate first and second doped regions of a second conductivity type arranged in columns embedded in the semiconductor body and spaced one from the other to define a channel region therebetween, a plurality of floating gate members in rows insulated from the substrate, each of the plurality of floating gate members defining a row having its one end thereof disposed over a respective channel region to define a first capacitance between the floating gate member and the body of the semiconductor material, the improvement comprising:

a plurality of rows of conductive layers, the layer of each row insulated from and aligned with the floating gate members in a given row to define a second capacitance between the conductive layer and the overlying floating gate member; and

an extended floating gate portion affixed to the other end of the floating gate member and extending therefrom over a first doped region associated with the respective channel region of one memory device to an adjacent second doped region of the next adjacent memory device to define a third capacitance between the other end of the floating gate member and to the adjacent doped region whereby, when a first source of potential is applied to the first and second regions and the body of semiconductor material and a second source of potential is applied to the adjacent doped region and a conductive layer, the second and third capacitances are effectively in parallel.

4,442,448

LOGIC INTEGRATED CIRCUIT DEVICE

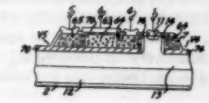
Masafumi Shimbo, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

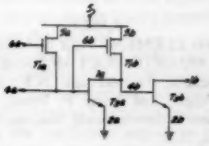
Filed Oct. 21, 1980, Ser. No. 199,268

Claims priority, application Japan, Oct. 26, 1979, 54-138557

Int. Cl.³ H01L *27/04;* **H03K** *19/091, 19/094*

U.S. Cl. 357—42 **1 Claim**





1. An integrated logic circuit device including a first unit logic circuit comprising a lateral load transistor and a vertical static induction driving transistor, wherein said static induction transistor comprises a first semiconductor region of a first conductivity type with a high impurity concentration, a second semiconductor region of the first conductivity type with a low impurity concentration and disposed on and adjacent to said first region and defining a channel region of said static induction transistor, a third semiconductor region of the first conductivity with a high impurity concentration disposed on and adjacent to said second region, and a fourth semiconductor region defining a gate region of a second conductivity type opposite to said first conductivity type and surrounding a side portion of said channel region defined by said second semiconductor region to control the current between said first and said third regions, and said lateral transistor comprises an insulating film overlying a portion of said first region extending thereunder, a fifth semiconductor region of said second conductivity type disposed on said insulating film and defining an injector, a sixth semiconductor region having a low impurity concentration and disposed adjacent to said fifth region and on said insulating film and defining a channel region of said lateral transistor, and a seventh semiconductor region comprised of a portion of said fourth region adjacent to said sixth region and at least partially disposed on said insulating film, said lateral transistor comprising an insulating gate field effect transistor comprised of said fifth, said sixth, and said seventh regions, a second insulating film disposed on the surface of said sixth region of said first conductivity type and defining a gate insula-

tor, and a gate electrode on said second insulating film; and a second unit logic circuit wherein said gate electrode of said lateral transistor and said fourth region of said static induction transistor are respectively wired to a gate region and a drain region of a static induction transistor as a driving transistor of said second unit logic circuit, said second unit logic circuit comprising a lateral transistor and a static induction transistor.

4,442,449

BINARY GERMANIUM-SILICON INTERCONNECT AND ELECTRODE STRUCTURE FOR INTEGRATED CIRCUITS

William I. Lehrer, Los Altos, and Bruce E. Deal, Palo Alto, both of Calif., assignors to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Mar. 16, 1981, Ser. No. 243,986
Int. Cl.³ H01L 29/163, 29/54
U.S. Cl. 357—67 7 Claims

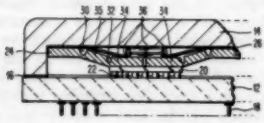
1. An integrated circuit semiconductor structure comprising a semiconductor substrate, a plurality of selectively doped regions in said substrate as part of an integrated circuit and means for conductively interconnecting said regions, said interconnecting means comprising a germanium-silicon binary alloy.

4,442,450

COOLING ELEMENT FOR SOLDER BONDED SEMICONDUCTOR DEVICES

Lewis D. Lipschutz, Poughkeepsie, N.Y.; Ralph E. Meagher, Vicksburg, Mich., and Frank P. Presti, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1981, Ser. No. 249,262
Int. Cl.³ H01L 23/02; H02B 1/00; H05K 7/20; F28F 7/00
U.S. Cl. 357—81 7 Claims



1. In an electronic package having a support substrate, at least one electronic device mounted on the substrate, a cover mounted on said substrate disposed over said device having a surface in spaced proximity to said device, the improvement comprising,

a thermal bridge for conducting heat from said device to said cover comprising a relatively thick metal sheet with a thickness in the range of 0.005 to 0.050 inches and provided with cuts that define at least one tab element,

at least two grooves in said tab element that make it bendable, with a portion positionable in a plane that is parallel and laterally displaced from the plane of said sheet, said grooves extending through 50 to 98 percent of the thickness of said metal sheet,

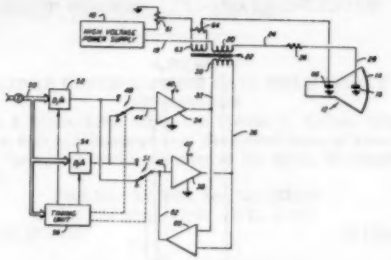
a leaf-like spring element positioned in overlying relation to said metal sheet to selectively urge said tab element into contact with said device.

4,442,451

DIFFERENTIAL RANDOM COLOR SWITCH FOR BEAM PENETRATION CRT

Michael H. Kalmanash, Fairfield, and Edward L. Young, West Haven, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 1, 1981, Ser. No. 259,381
Int. Cl.³ H04N 9/27; H01J 23/34
U.S. Cl. 358—73 5 Claims



1. A high voltage color switch for a beam penetration cathode-ray tube in which a first color write period in a randomly selected color is immediately followed by a second color write period in a complementary color in response to an input waveform, comprising:

a high voltage power supply having an output selected to provide a baseline color when presented to the anode of said cathode-ray tube;

a high voltage transformer connected between the output of the anode of said high voltage power supply and said cathode-ray tube, said transformer including a primary winding for applying said input waveform to said anode of said CRT;

driver means including a pair of operational amplifiers, each having an input, and an output which are respectively connected to one side of said primary winding; and

switch means presenting said input waveform to said inputs of said amplifiers in said first color write period and differentially presenting said input waveform to said inputs of said amplifiers in said second color write period.

4,442,452

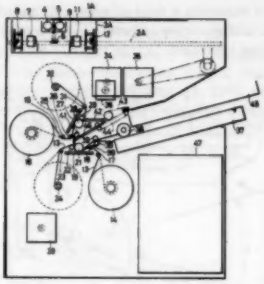
TWO-COLOR COPYING MACHINE

Masami Kurata; Fujio Moriguchi; Takashi Ohmori, and Katsuo Makino, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1981, Ser. No. 334,337
Claims priority, application Japan, Dec. 26, 1980, 55-183841
Int. Cl.³ H04N 1/46
U.S. Cl. 358—75 15 Claims

1. A two-color copying machine comprising a platen for placing thereon an original document to be copied, a scanner unit for reading out one line at a time from said original document during relative movement between said platen and scanner unit and for generating picture signals representing at least two different colors, first and second thermal heads having respective heaters and responsive to reception of picture signals for selectively heating said heaters, first ink donor sheet supply means for supplying a first ink donor sheet which records in a first recording color to the heaters of said first thermal head, second ink donor sheet supply means for supplying a second ink donor sheet which records in a second recording color different from said first recording color to the heaters of said second thermal head, first transfer means for pressing a severed sheet of recording paper intimately against said first thermal head with said first ink donor sheet interposed therebetween to record a first color image on said sheet, second transfer means for pressing said sheet of recording paper against

said second thermal head with said second ink donor sheet interposed therebetween to record a second color image on



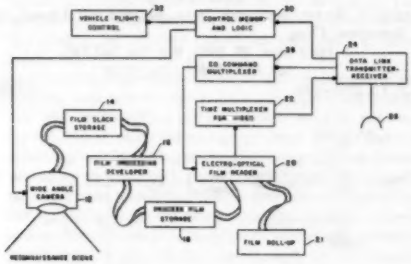
said sheet, and paper discharge means for discharging said sheet of recording paper.

4,442,453

PHOTO-RECONNAISSANCE SYSTEM

James E. Verdier, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 9, 1982, Ser. No. 347,383
Int. Cl.³ H04N 7/18
U.S. Cl. 358—109 **9 Claims**



6. A method of performing aerial reconnaissance missions from an airborne station, said method comprising the steps of:

photographing a scene on film with a camera having a wide angle lens, with a field of view having a long axis transverse to the direction of flight;

developing said film;

reading said developed film using an electro-optical reader and converting information found on the film to a video signal which includes dividing said field of view into N photo frames and converting at least a portion of each photo frame into a video frame; the electro-optical reading means being controllable to select a particular location of a frame of said film of a particular size for full video frames to be displayed on a full video screen thereby resulting in an enlargement effect;

transmitting said video signal to a receiver at an associated ground station;

displaying said video signal at said ground station, on N video screens, with each video screen corresponding to a frame of the field of view so that the display on each screen remains motionless for a short period of time;

inputting commands from an operator at each screen at the ground station, which may include commands to select a particular portion of the corresponding frame to be displayed on a full video screen; and

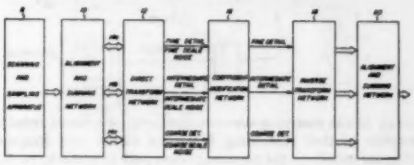
transmitting said commands to a receiver on said airborne station.

4,442,454

IMAGE PROCESSING METHOD USING A BLOCK OVERLAP TRANSFORMATION PROCEDURE

Philip G. Powell, Pinner, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,826
Int. Cl.³ H04N 5/21
U.S. Cl. 358—167 **8 Claims**



1. A method of processing an original image in order to generate a processed image having fewer unwanted components than the original image, said method comprising the steps of

A. generating image signals related to the brightness of respective elements of the original image;

B. grouping the image signals into arrays of image signals corresponding to overlapping blocks of image elements, wherein each block includes at least one image element in common with at least one other block;

C. processing the arrays in a hierarchy of separate stages in which the image signals generated for each stage subsequent to the first represent derived signals responsive to combinations of large signals from a preceding stage, each stage comprising the steps of

(1) transforming each array of image signals by a set of independent functions into a corresponding set of coefficient signals representing combinations of image signals sensitive to general brightness and image detail, and

(2) subjecting the coefficient signals to modification in order to minimize the unwanted components in the processed image; and

D. generating a processed image from the sets of coefficient signals, some of which may be modified,

whereby the processed image is generated without a characteristic block-like structure due to block transform processing while the wanted components of the image are rendered with minimal image loss or distortion.

4,442,455

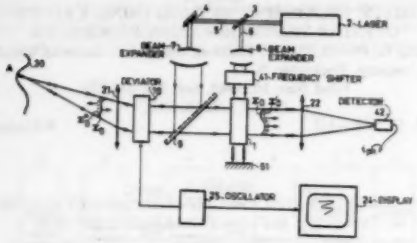
OPTICAL SYSTEM FOR OBSERVATION IN REAL TIME WITH SCANNING

Jean P. Huignard, and Marcel Malard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 5, 1981, Ser. No. 260,784
Claims priority, application France, May 8, 1980, 80 10245
Int. Cl.³ H04N 5/30
U.S. Cl. 358—209 **3 Claims**

1. An optical system for the real time observation of an object comprising a coherent radiation source, a deviator ensuring the scanning of the object by means of a concentrated beam of radiated energy from the source, optical means for the detection of the radiation emerging from the illuminated area of the object, the radiation from the object being transmitted by inverse return, via the deviator and means for the display of an image of the object produced from the signals from the optical detection means, the coherent source applying in addition to the concentrated beam a pumping beam, the beam from the object and the pumping beam interfering in an interaction medium in which the spatial modulation of light intensity

resulting from the interference fringes induces in the said medium a spatial modulation of the refractive index, the system of layers photoinduced in this way diffracting a fraction of the



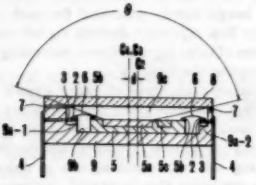
energy of the pumping wave in the form of a wave front isomorphic of that emanating from the object and frequency changing means on the pumping beam path in order to perform a heterodyne detection.

4,442,456

SOLID-STATE IMAGING DEVICE

Yoshio Iwata, Tachikawa; Tsutomu Fujita, Mobara; Tsunehisa Horiuchi, and Youichi Shimizu, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,809
Claims priority, application Japan, Jun. 2, 1980, 55-72761
Int. Cl.³ H04N *3/14*
U.S. Cl. 358—213 **2 Claims**



1. In a solid-state imaging device comprising a light-receiving element which has a light-receiving portion and a circuit portion for driving said light-receiving portion, that are formed on the same plane, and a package which has an accommodation portion of a recessed shape in section to accommodate said light-receiving element in such a manner that the bottom surface of said light-receiving element is adhered onto the accommodation portion, the improvement wherein the center axis of the light-receiving portion of said light-receiving element is brought into agreement with the center axis of said imaging device.

4,442,457

CHARGE COUPLED DEVICE FOCAL ZOOM

Michael Y. Pines, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 17, 1981, Ser. No. 331,505
Int. Cl.³ H04N *3/15*
U.S. Cl. 358—213 **12 Claims**

1. A charge coupled device focal zoom comprising:

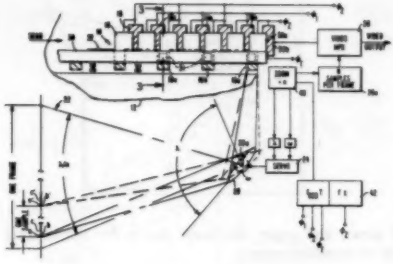
a semiconductive substrate;

a column of photodetector diodes formed in said substrate;

a charge coupled device serial register adjacent said photodetector column, said register comprising a plurality of charge storage cells, certain ones of said cells periodically receiving charge from corresponding ones of said detectors in said column;

means for serially transferring charge stored in said register through said register in serial succession in one direction in synchronism with a clock signal having a frequency f_{ccd};

means for scanning a field of view subtended by an angle α across said detector column at a scanning rate ω in synchronism with said charge transfer means; and



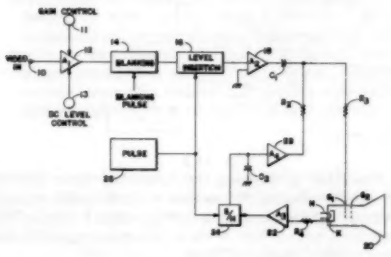
means for reducing said scanning rate ω, said clock signal frequency f_{ccd} and said scan angle α by a zoom magnification factor n so that said scanning rate becomes ω/n, said frequency f_{ccd} becomes f_{ccd}/n and said angle becomes α/n.

4,442,458

CRT VIDEO DRIVE CIRCUIT WITH BEAM CURRENT STABILIZATION

Archie M. Barter, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 29, 1982, Ser. No. 363,342
Int. Cl.³ H04N *5/68, 5/18*
U.S. Cl. 358—243 **3 Claims**



1. A video amplifier for driving a cathode-ray tube in response to a video signal, said tube including a control grid and a cathode, comprising:

first amplifier means having an output terminal connected to said control grid and responsive to said video signal for amplifying said video signal thereby generating a control signal for driving said control grid;

converter means connected to said cathode of said cathode-ray tube for sensing the current from said cathode and for converting the sensed current into a voltage representative thereof in response thereto; and

second amplifier means connected to the converter means for amplifying said voltage thereby generating an amplified voltage signal, said second amplifier means having an output terminal connected to the output terminal of said first amplifier means,

the bandwidth of said first amplifier means being wider than the bandwidth of said second amplifier means, the dynamic range of said amplified voltage signal from said

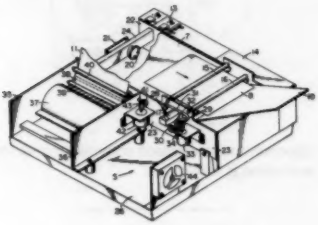
second amplifier means being larger than the dynamic range of said control signal from said first amplifier means.

4,442,459

FACSIMILE TRANSCEIVER

Masahisa Fukui, and Yoshio Ito, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 121,655, Feb. 15, 1980, abandoned.
This application Sep. 9, 1981, Ser. No. 300,583
Claims priority, application Japan, Mar. 3, 1979, 54-24939; Mar. 29, 1979, 54-37383
Int. Cl.³ H04W *1/04*
U.S. Cl. 358—286 **4 Claims**



1. A facsimile transceiver comprising:

an emitting unit having a carrying surface at its upper portion and which defines a rectilinear path along which an original to be transmitted is guided, original advancing means for advancing the original carried on said carrying surface, and means disposed under said carrying surface for reading the original during its rectilinear advancement; and

a receiving unit combined into an integral structure with said emitting unit, said receiving unit being juxtaposed side-by-side with said emitting unit so that said units do not overlap with each other when viewed from above, and said receiving unit including means for supporting roll-formed recording material such that the rotating axis of the roll is parallel to the advancing direction of the original, means for recording image information on the recording material in accordance with received signals, advancing means for advancing the recording material with the information recorded thereon in a direction which is perpendicular to the advancing direction of the original, and means defining a discharge port in a top cover of said receiving unit through which the recording material advanced by said advancing means is discharged, the discharge port extending in a direction parallel and to one side of the advancing path of the original;

wherein the advancing path along which the original advances after being scanned does not overlap with the receiving unit, when viewed from above.

4,442,460

COPYING MACHINE

Masami Kurata; Fujio Moriguchi; Toshiharu Inui, and Tomio Murayama, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Dec. 10, 1981, Ser. No. 329,466
Claims priority, application Japan, Dec. 10, 1980, 55-174075; Dec. 10, 1980, 55-174076
Int. Cl.³ H04M *1/22*
U.S. Cl. 358—296 **23 Claims**

1. A thermal recording type copying machine, comprising:

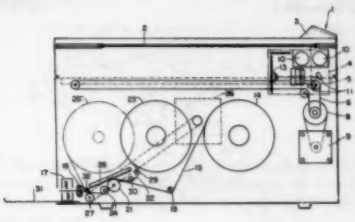
a platen for arranging an original thereon, said original having image information thereon;

a read unit for reading the image information of the original during relative movement of said platen and read unit and for converting the read image into electrical picture signals;

a stationary thermal recording head having heating elements for generating heat in accordance with said electrical picture

an ink donor member stored in a first source;

a continuous recording paper web stored in a second source;



conveying means for conveying said ink donor member and said recording paper web in juxtaposition to each other from said first and second sources, while being in close contact under pressure, past said heating elements of said thermal recording head;

means for taking up said ink donor member; and

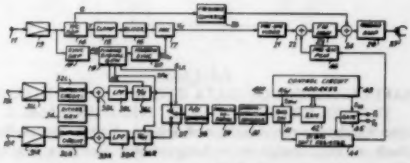
means for cutting only said recording paper and for discharging said cut recording paper from said machine.

4,442,461

SIGNAL RECORDING AND/OR REPRODUCING TECHNIQUE

Hidemichi Shirai, Tokyo; Kenji Nakano, Ebina, and Hisayoshi Moriwaki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 29, 1981, Ser. No. 316,328
Claims priority, application Japan, Oct. 31, 1980, 55-154128
Int. Cl.³ H04N *7/04, 5/76*
U.S. Cl. 358—343 **19 Claims**



1. A method of transmitting a video signal containing regularly spaced blanking intervals alternating with video information intervals containing video information, with pulse code modulated digital information being inserted in a portion of each of said blanking intervals, comprising:

emphasizing said video information with one amount of preemphasis;

emphasizing said digital information with another amount of preemphasis independent of the first-mentioned amount of preemphasis;

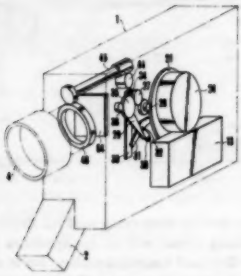
inserting the preemphasized digital information into said portions of the blanking intervals to form a combined video signal; and

transmitting said combined video signal on a carrier.

4,442,462
VIDEO RECORDER/CAMERA HAVING A SHARED DRIVE

Takeshi Kimura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,332
Claims priority, application Japan, Sep. 4, 1980, 55-122857
Int. Cl.³ H04N 5/782
U.S. Cl. 360—33.1 7 Claims



1. A video recorder comprising:
(a) image pick-up means for converting an optical image into an electrical signal;
(b) an optical system which forms the optical image by guiding light flux from an object to be recorded to said image pick-up means;
(c) control means responsive to a driving force for controlling the condition of the light flux to be guided to the image pick-up means, said control means driving at least a part of the optical system;
(d) recording means for recording the electrical signal from the image pick-up means on a recording medium;
(e) displacement means responsive to a driving force for displacing the recording medium between a first position at which a case for housing the recording medium is loaded from the outside of the video recorder, and a second position at which a recording operation by the recording means can be performed;
(f) a drive source for providing a driving force; and
(g) transmission means arranged to be shiftable to selectively transmit the driving force of the drive source to one of said displacement means and said control means.

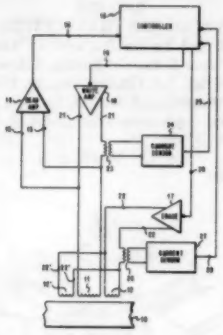
4,442,463
SAFEGUARDING OF DATA RECORDED ON DISK BY TUNNEL ERASE MAGNETIC HEAD ASSEMBLY

Rajan Krishnamurty, Austin, and John A. Voltin, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 208,736, Nov. 20, 1980. This application Nov. 29, 1982, Ser. No. 445,123
Int. Cl.³ G11B 15/04, 5/47
U.S. Cl. 360—60 7 Claims

1. In apparatus for recording data in tracks on magnetic storage disks including a tunnel erase magnetic head recording assembly movable along said tracks and comprising a magnetic read/write transducer for magnetically recording data along said tracks and at least one magnetic erase transducer adjacent to said write transducer for limiting the width of recorded data, means for safeguarding data recorded on said disks comprising:

means operative during quiescent conditions when said apparatus is not writing nor reading and during operating conditions when said apparatus is reading or writing for sensing the activation of said erase transducer, and

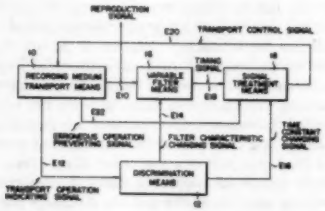


means responsive to said sensed activation for determining if said activation is erroneous.

4,442,464
DEVICE FOR DETECTING A SPACE BETWEEN ADJACENT BLOCKS OF DATA RECORDED IN A RECORDING MEDIUM

Takeshi Ito, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 151,916, May 21, 1980, abandoned. This application Mar. 25, 1982, Ser. No. 361,789
Claims priority, application Japan, May 24, 1979, 54-64191
Int. Cl.³ G11B 15/16, 15/52, 19/10
U.S. Cl. 360—72.1 47 Claims

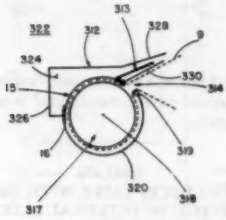


18. A detector for detecting a space between adjacent blocks of data recorded on a recording medium, comprising:
(a) a recording medium transport means for transporting a recording medium with a given speed, said recording medium transport means having several operation modes and providing a reproduction signal corresponding to information recorded on the recording medium and a transport operation indicating signal identifying the operation mode of said transport means;
(b) a discrimination means for discriminating the transport operation indicating signal, said discrimination means providing a filter characteristic changing signal in accordance with the transport operation indicating signal;
(c) a variable filter means for filtering the reproduction signal and providing a timing signal, the filtering characteristic of said variable filter means changing in accordance with the filter characteristic changing signal; and
wherein the operation mode of the recording medium transport means is changed by a transport control signal corresponding to the timing signal.

4,442,465
TUNNEL FOR TAPE ACCUMULATION DURING WIND-OFF

Lee V. Hedlund, Maple Shade, and Jerome D. Shields, Somerdale, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 20, 1981, Ser. No. 313,314
Int. Cl.³ G11B 15/60
U.S. Cl. 360—130.23 4 Claims

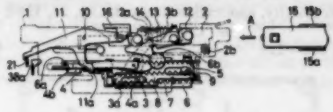


1. An improved tape transport arrangement comprising:
a tape supply reel adapted for supplying tape;
a tape takeup reel adapted for taking up tape from said supply reel;
a generally cylindrical headwheel about which said tape is adapted to be disposed for transducing signals therewith;
a peripheral shield extending about at least a portion of the cylindrical surface of said headwheel and spaced therefrom,
guide means located near an end of said peripheral shield, said guide means being located at a predetermined distance form said cylindrical surface of said headwheel, said predetermined distance being on the order of magnitude of the thickness of said tape;
drive means coupled to said tape for transferring tape from said supply reel to said takeup reel, whereby said tape will come loose from said supply reel thereby creating a free end of tape;
drive means coupled to said headwheel for rotating said headwheel for peripheral rotation in the direction of said tape motion resulting from said transfer of tape from said supply reel to said takeup reel whereby the rotation of said headwheel imparts to said tape a motion which drives a portion of said tape including said free end of said tape towards said guide means, whereby said motion imparted to said tape may cause said tape to accumulate near said guide means and jam between said guide means and said cylindrical surface of said headwheel;
the improvement comprising:
a tunnel formed of walls which together with the walls of said peripheral shield enclose substantially the entire periphery of said headwheel, the walls of said tunnel defining a tunnel axis projecting away from said cylindrical surface beginning at a location near said guide means and defining a tunnel having a decreasing width with increasing distance from said cylindrical surface to provide a location for accumulation of said tape away from said cylindrical surface of said headwheel; and
a smooth curve on the tape-engaging portion of said guide means for guiding tape from said tunnel with a radius of curvature much larger than the thickness of said tape.

4,442,466
HEAD DRIVE MECHANISM FOR A CASSETTE DECK

Mikio Isaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 19, 1982, Ser. No. 350,484
Claims priority, application Japan, Feb. 20, 1981, 56-24714; Feb. 20, 1981, 56-24715
Int. Cl.³ G11B 5/54, 21/02
U.S. Cl. 360—75 15 Claims

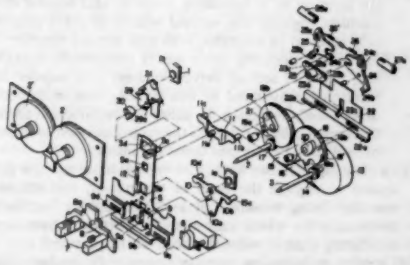


1. A head drive mechanism for a cassette deck, comprising:
a movable member which, when rotation of a reel unit is stopped, is reciprocated by the drive of a drive motor for said reel unit;
a head drive lever which is coupled to a head, for advancing said head when driven;
an operating member which is operated in association with the reciprocation of said movable member;
an elastic member which elastically couples said operating member to said head drive memeber; and
locking means for locking said head when said head is advanced a predetermined distance and for unlocking said head and advancing said head quickly when said movable member reciprocates over a predetermined distance.

4,442,467
DRIVE MECHANISM FOR CASSETTE TAPE RECORDING/REPRODUCING APPARATUS

Yuji Ikedo, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 306,530
Claims priority, application Japan, Sep. 30, 1980, 55-135268
Int. Cl.³ G11B 5/54
U.S. Cl. 360—105 10 Claims



1. In a drive mechanism for a cassette tape recording/reproducing apparatus comprising a head base movable among the stop, pause and playback positions, normally biased to the stop position and having a recording/reproducing head mounted thereon, a pair of forward and reverse capstans, and a pair of forward and reverse pinch rollers adapted to be moved in contact with the capstans,
the improvement comprising
a pair of assist gears adapted to be driven by the capstans,
actuating means for independently placing one of the assist gears in rotating engagement with the corresponding capstan,
selector means mounted on the head base so as to be movable between the positions engageable with the forward and reverse pinch rollers under the control of the rotating assist gear, and
means associated with said actuating means for advancing the head base,

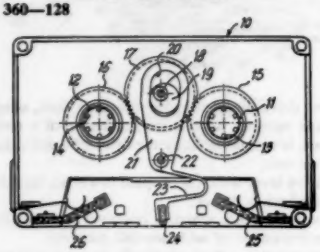
whereby when one assist gear is rotated, the head base is advanced with said selector means being at the position engageable with the corresponding pinch roller.

4,442,468

CASSETTE CLEANING DEVICE

Stephane M. d'Alayer de Costemore d'Arc, Brussels, Belgium, assignor to Allsop, Inc., Bellingham, Wash.

Filed Oct. 16, 1981, Ser. No. 312,370
Claims priority, application Belgium, Oct. 24, 1980, 885871
Int. Cl.³ G11B *5/10*
U.S. Cl. 360—128 **9 Claims**



1. A cleaning device for cleaning a head of a tape cassette player, where said player has a cassette receiving area to receive a tape cassette in a playing position, and a pair of spaced spindles to engage first and second spools of said tape cassette, which spindles are at predetermined spindle locations in said cassette receiving area, said device comprising:

(a) a cassette housing adapted to be inserted in said cassette receiving area in an operating location;

(b) a drive system comprising:

(1) a first drive member rotatably mounted in said cassette housing at a first drive location where, with said housing in its operating position, said first drive member engages said first spindle in drive relationship so as to be rotatable with said first spindle;

(2) a second drive member rotatably mounted in said cassette housing at a second drive location where, with the housing in its operating position, said second drive member engages said second spindle in drive relationship so as to be rotatable with said second spindle;

(3) an interconnecting drive means operatively engaging said first and second drive members in a manner that rotational movement of one of said first and second drive members causes the other of said first and second drive members to rotate in the same direction as the one of said first and second drive members;

(c) a cleaning member having an end cleaning portion positioned to engage the head of the player, said cleaning member being mounted in said housing for oscillating movement by which said cleaning portion moves in an oscillating path to wipe the head of the player;

(d) a drive transmitting member operatively connected between the drive system and the cleaning member to translate rotating motion of said first and second drive members to oscillating movement of said cleaning member; whereby when either spindle of the player is rotated under power from the player, the drive member engaging that spindle is caused to rotate to insure that the other of the spindles is rotating, and the cleaning member is caused to move in its oscillating path to clean the head of the player.

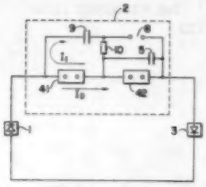
4,442,469

DC CIRCUIT BREAKER APPARATUS

Satoru Yanabu, Tokyo; Tohoru Tamagawa, Chigasaki, and Takumi Funahashi, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 18, 1982, Ser. No. 409,174
Claims priority, application Japan, Aug. 26, 1981, 56-132679
Int. Cl.³ H02H *7/22*
U.S. Cl. 361—4 **5 Claims**

1. A DC circuit breaker apparatus comprising a first interrupter and a second interrupter connected in series in a DC power supply line, a first capacitor and a discharge gap respectively connected in parallel with said first and second interrupters so that said first capacitor and said discharge gap are connected in series, an impedance element connected between a first junction between said first capacitor and said discharge



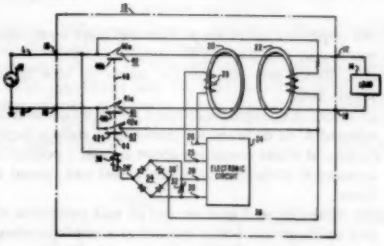
gap and a second junction between said first and second interrupters, and a second capacitor connected in parallel with said second interrupter.

4,442,470

GROUND FAULT RECEPTACLE WITH ARRANGEMENT FOR PROTECTING INTERNAL ELECTRONICS

John J. Misencik, Shelton, Conn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1982, Ser. No. 416,786
Int. Cl.³ H02H *3/33*
U.S. Cl. 361—46 **5 Claims**



1. A ground fault receptacle comprising:

first and second pairs of cooperable contacts, each of said pairs of contacts being operable between an open position and a closed position with one of said contacts of each of said pairs of contacts being stationary and the other of said contacts of each of said pairs of contacts being movable, said first pair of contacts being connectable in series with a hot line conductor (L) of the electrical distribution system and said second pair of contacts being connectable in series with a neutral conductor (N) of the electrical distribution system;

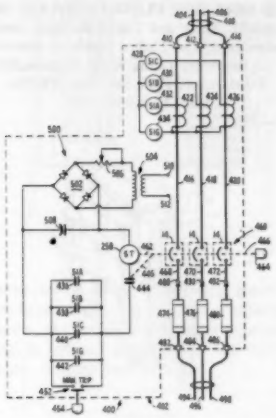
ground fault sensing and interrupting means associated with conductors L and N for causing opening of said first and second pairs of contacts upon a ground fault, said ground fault sensing means comprising an electronic circuit responsive to a sensed ground fault to energize a solenoid trip coil whose plunger causes release of a latch member holding said pairs of contacts in the closed position and resulting in movement of said movable contacts of said pairs of contacts to the open position;

means for suppling operating power to said electronic circuit comprising conductive connections from said conductors L and N wherein said conductive connection from one of said conductors N comprises said latch member which has a closed position in contact with said one conductor and an open position spaced therefrom, and said latch member moves from said closed position to said open position upon a trip prior to the opening of either of said first and second pairs of contacts.

4,442,471
METHOD AND APPARATUS FOR SHORT CIRCUIT PROTECTION OF HIGH VOLTAGE DISTRIBUTION SYSTEMS

Frank C. Trayer, 25690 LaLanne Ct., Los Altos Hills, Calif. 94022

Division of Ser. No. 172,211, Jul. 25, 1980, Pat. No. 4,336,520. This application Mar. 15, 1982, Ser. No. 358,200
Int. Cl.³ H02H 7/00
U.S. Cl. 361—63 15 Claims



1. A short circuit protection system for a high voltage alternating current distribution system, comprising:

current limiting fuse means adapted to be connected in circuit in a high voltage power line extending between said high voltage alternating current distribution system and a source of high voltage alternating current power;

vacuum circuit breaker means, including solenoid-operated tripping means, adapted to be connected in series with said current limiting fuse means between said distribution system and said source of power;

overload current detecting means for detecting fault currents in said distribution system and providing a tripping signal to trip said vacuum circuit breaker means;

winding means inductively coupled to at least one conductor of said power line and insulated from said power line;

rectifying means for rectifying an alternating current voltage derived from said winding means and producing a unidirectional current;

electrical energy storage means for storing electrical energy derived from said uni-directional current; and

circuit means for energizing the solenoid means of said solenoid-operated tripping means from said electrical energy storage means under the control of said overload current detecting means.

4,442,472
SOLID STATE TRIP CIRCUIT WITH DIGITAL TIMER

Peter N. C. Pang, Lawrenceville, Ga., and Boris Rozhansky, Skokie, Ill., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Mar. 26, 1982, Ser. No. 362,431
Int. Cl.³ H02H 7/26
U.S. Cl. 361—96 57 Claims

28. An electrical circuit for actuating the trip mechanism of a circuit interrupter comprising:

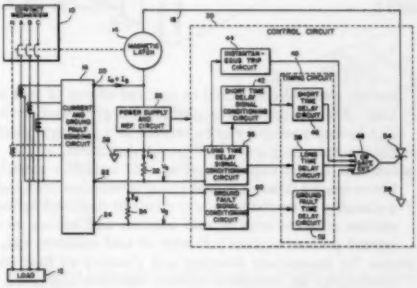
current sensing means cooperating with at least one electrical power conductor for sensing the amount of current flowing in said electrical power conductor and producing a sensed current signal indicative thereof;

power supply means for receiving said sensed current signal and for deriving power therefrom;

means for developing a voltage signal proportional to said sensed current signal;

control means connected to said power supply means for receiving power therefrom and responsive to the magnitude of said voltage signal for actuating the trip mechanism of said circuit interrupter when said current flowing in said electrical power conductor exceeds a predetermined level, said control means including a first amplifier circuit for amplifying said voltage signal to a desired level, said first amplifier circuit including input and output terminals and means for changing the gain of said first amplifier circuit to thereby adjust the level at which said trip mechanism will be actuated;

said control means further including a second amplifier circuit connected to the output of said first amplifier circuit for amplifying the output of said first amplifier circuit to a desired level, said second amplifier circuit including input and output terminals and means for changing the gain of said



second amplifier circuit to thereby adjust another level at which said trip mechanism will be actuated;

a ground fault current sensing means cooperating with said current sensing means for sensing ground fault currents in one or more electrical power conductors and producing a ground fault current signal indicative thereof, and means for developing a ground fault voltage signal proportional to said sensed ground fault current signal, said control means further including a third amplifier circuit for amplifying said ground fault voltage signal to a desired level, said third amplifier circuit including input and output terminals and means for changing the gain of said third amplifier circuit to thereby adjust the level at which said trip mechanism will be actuated;

said control means further including a timing circuit having input and output terminals and a priority circuit connected to said first, second and third amplifier circuits for determining which of of the output terminals of said first, second and third amplifier circuits will be connected to the input terminal of said timing circuit.

4,442,473
MULTI-SECTION POWER CAPACITOR WITH INTERNAL FUSING ARRANGEMENT

Barry L. Holtzman, Richland, and George E. Mercier, Bloomington, both of Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 13, 1982, Ser. No. 397,754
Int. Cl.³ H01G 1/11, 4/38
U.S. Cl. 361—275 5 Claims

1. A power capacitor comprising:

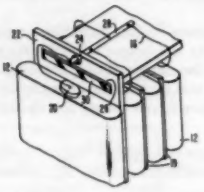
a plurality of wound capacitor sections in an enclosure having first and second terminals extending through said enclosure;

each of said capacitor sections comprising first and second

electrodes and one or more sheets of dielectric material between said electrodes on both sides of said respective electrodes, said plurality of wound capacitor sections being assembled in a stack within said enclosure with ends of said sections being substantially aligned;

connection means for selectively connecting said sections into electrically parallel groups of sections and for selectively connecting said electrically parallel groups of sections in series with said terminals, said connection means comprising fusing means for opening the connection of an individual one of said sections upon a dielectric breakdown within said individual section;

said fusing means comprising a plurality of fuse wires each



having one end connected to one end of one of said sections of one of said electrically parallel groups of sections and having a second end connected to a common electrical bus extending over said group of sections;

means for insulatively supporting said common electrical bus in spaced relation to said group of sections comprising a plurality of insulative spacer elements disposed between certain adjacent ones of said sections and having an extended portion beyond said ends of said sections; and,

means for insulatively locating said plurality of fuse wires comprising an insulative locater member supported by said insulative spacer elements that support said bus with each of said fuse wires extending from a point on one of said sections around said locater member to said bus.

4,442,474

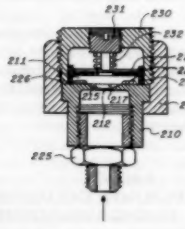
CAPACITIVE PRESSURE TRANSDUCER

Joannes N. M. de Jong, West Ford, and Richard L. Earle, Mendon, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,527

Int. Cl.³ H01G 5/34; G01L 9/12

U.S. Cl. 361—283 **5 Claims**



1. A capacitive pressure transducer comprising:

a housing;

a threaded cylindrical diaphragm disposed in said housing and including a flexible plate having a concave surface region therein;

a relatively rigid plate having a groove conductive plate dielectrically separated from said flexible plate and disposed in said housing with insulation therebetween to be substantially parallel to regions of said flexible plate external to said concave surface region such that an airgap is formed between said relatively rigid plate and said concave surface region;

adapter means threaded into said cylindrical diaphragm for directing fluid to said flexible plate;

a cover for said housing; and

spring-screw means mounted on said cover for exerting an adjustable force on said relatively rigid plate.

4,442,475

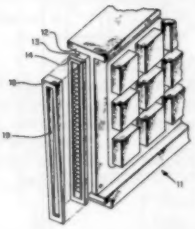
TAPERED SEAL FOR FLOW-THROUGH MODULE

James L. Franklin, Kent, and Ted J. Kramer, Seattle, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1982, Ser. No. 395,566

Int. Cl.³ H05K 7/20

U.S. Cl. 361—383 **4 Claims**



1. In a modular electronic system having a plurality of electronic modules each having a metallic frame with the ends of each said metallic frame being slidably mounted in opposed grooves in first and second parallel side plates, an improvement comprising,

a heat exchanger core said metallic frame,

a tapered seal on each end of said heat exchanger core, said tapered seal having an opening therethrough,

a complementary tapered surface on a face in each groove whereby said tapered seal wedges said electronic module in said groove and provides an air seal between said electronic module and said side plates, and

means for passing cooling air through said heat exchanger core.

4,442,476

VERSATILE PRINTED CIRCUIT BOARD TERMINATION RACK

Bruce N. Lenderking, Glen Burnie, and Casper J. Bocklage, Jr., Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 17, 1981, Ser. No. 293,551

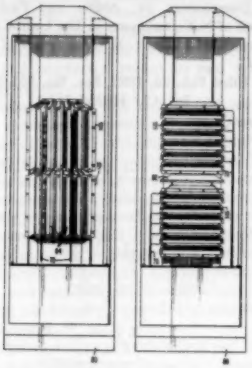
Int. Cl.³ H05K 7/18

U.S. Cl. 361—395 **2 Claims**

1. A versatile printed circuit board termination rack assembly for mounting in an instrument cabinet, comprising,

a rack means including means for securing said rack means within an instrument cabinet, said rack means including alternate electrical cable troughs and printed circuit board enclosures, said printed circuit board enclosures are elongated rectangular enclosures having an open end to accomodate the insertion of a printed circuit board assembly, said enclosures including electrical connector means to mate with a printed circuit board assembly inserted within the enclosure, said cable troughs alternately located between said printed circuit board enclosures corresponding to passages provided by the spacing between adjacent printed circuit board enclosures to accommodate the electrical cabling for connection to a printed circuit board assembly positioned within the printed circuit

board enclosure, the height and width dimensions of said rack means being equal such that said rack means may be mounted in an instrument cabinet with said printed circuit board enclosures being oriented vertically or horizontally,



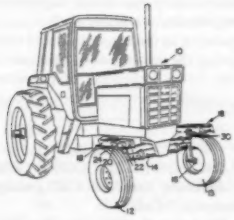
the horizontal mounting of the rack means resulting in isolation between the cable troughs of adjacently mounted rack means, the vertical mounting of adjacent rack means resulting in vertical alignment of the cable troughs of adjacently mounted rack means.

4,442,477

STEERING LIGHT ARRANGEMENT

Richard G. Hennessey, Oak Lawn, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Dec. 21, 1981, Ser. No. 333,206
Int. Cl.³ B60Q 1/12, 1/24
U.S. Cl. 362—52 6 Claims



1. A steering light arrangement mounted on a land vehicle and connected to at least one vehicle guide wheel for synchronous angular movement therewith comprising:

a height adjustable fenderlet, partially covering said guide wheel and synchronously rotatable therewith, including a built-in light pod located above and in close proximity to said guide wheel and comprising multi-directional light emitting means;

said guide wheel having an axle mechanically connected to a vehicle steering mechanism for rotating said axle and said wheel in a substantially horizontal plane;

a fenderlet support element rigidly connecting said pod with said steering mechanism and

said fenderlet support element comprising an extendible bracket facilitating adjustment of said fenderlet location correlating to various dimensions of said guide wheel;

said light emitting means comprising a headlight lamp lighting the area essentially aligned with the line of a guide wheel movement and a flood lamp generating a wide angle beam light illuminating a territory along a vehicle side and substantially transversely to the line of said guide wheel movement;

said vehicle comprising another fenderlet with its light pod mounted on another guide wheel;

said another guide wheel interconnected with said one guide wheel via a bolster;

said light pods being independently interconnected with said vehicle steering mechanism;

an electrical conduit connecting said light emitting means with a vehicle electrical system, and

said conduit disposed within said bolster;

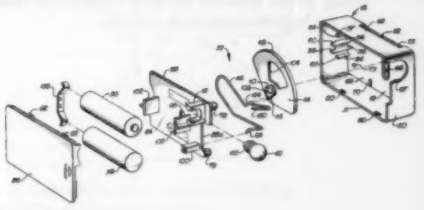
said light emitting means defining a vehicle width in all wheel positions.

4,442,478

AUTOMATICALLY ACTUATED ENCLOSURE LIGHT

Benjamin H. Stansbury, 409 N. Foothill Rd., Beverly Hills, Calif. 90210

Filed Feb. 19, 1982, Ser. No. 350,419
Int. Cl.³ F21L 7/00
U.S. Cl. 362—191 2 Claims



1. A battery-powered light for an enclosure which turns on when the enclosure is opened and turns off when the enclosure is closed, said light comprising

(a) a housing mountable to said enclosure having a base with interior and exterior surfaces, and wall means which are integral with the base and joined together to form the housing, said interior surface having a recess therein and a stop member extending outwardly therefrom, and said wall means having a first opening therein through which projects an arcuate edge portion of the actuator means defined below in paragraph (cii) when the light is turned on and a second opening therein for receiving a lightbulb,

(b) a divider wall in the housing to form therein a first compartment adapted to receive switching means and a second compartment adapted to receive battery means, said compartments being in communication with each other through a passageway and said divider wall having therein an elongated slot and thereon socket means for holding a lightbulb, and being located within the housing so that the elongated slot is aligned with the recess in the interior surface of the base and the socket means is aligned with said second opening, and

(c) switching means disposed in the first compartment which includes

(i) conductive spring means moveable between a bulb engagement position and a bulb disengagement position, said spring means having one end secured to the divider wall and adapted to contact battery means in the second compartment and an intermediate segment passing through the passageway between the compartments, said intermediate segment terminating in a bulb contact end adapted to contact a lightbulb in the socket means when the spring means is in the bulb engagement position and disengages from contact with the lightbulb when the spring means is in the bulb disengagement position,

(ii) actuator means for the spring means including a body member having cam means for engaging the spring means, an enlarged opening in the body member, axle

means outwardly projecting from the body member, and an arcuate edge along a portion of the body member, said actuator means being disposed in the first compartment so that the axle means is received within the elongated slot in the divider wall and the recess in the base, with the stop member passing through the enlarged opening in body member and the arcuate edge portion of the body member passing through the first opening in the wall means

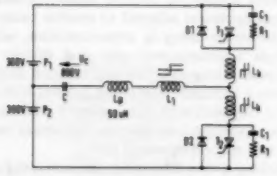
whereby, upon opening and closing of the enclosure, the arcuate edge portion engages a surface of the enclosure during relative movement between such enclosure surface and the arcuate edge portion, and depending upon the type of enclosure and the manner of mounting said housing to said enclosure, causing in one mode the body member to rotate about the axle means, and in another mode to move linearly inwardly and outwardly relative to the housing with the axle means moving within and being guided by said elongated slot and recess, and in a third mode to rotate and to move linearly simultaneously, with the cam means moving the spring means between the bulb engagement position and the bulb disengagement position.

4,442,479

INVERTER WITH SATURABLE REACTOR PROTECTION CIRCUIT

Tapani Mäkimaa, Lahti, Finland, assignor to Kemppi Oy, Lahti, Finland

Filed Feb. 2, 1982, Ser. No. 345,150
Claims priority, application Finland, Feb. 13, 1981, 810456
Int. Cl.³ H02M *7/515*
U.S. Cl. 363—136 **1 Claim**



1. An inverter circuit comprising a DC voltage source provided with a center tap in the source itself or in a voltage divider circuit connected across the source;

two thyristor switches connected in series in the forward direction across the DC voltage source;

two RC protection circuits, each one being connected across one of the thyristors, respectively;

two commutation diodes, each one being connected antiparallel with one of the thyristors, respectively; and

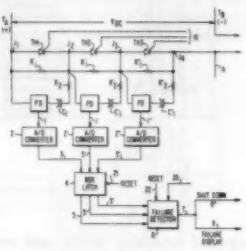
two reactors, each one being saturable and connected in series with one of the thyristors, respectively, a center branch branching out from a point between the thyristor switches to said center tap, said center branch including at least one capacitor and at least one saturable reactor.

4,442,480

PROTECTIVE CIRCUIT FOR THYRISTOR CONTROLLED SYSTEMS AND THYRISTOR CONVERTER EMBODYING SUCH PROTECTIVE CIRCUIT

Francis H. Downhower, Jr., Alden, and Paul T. Finlayson, Depew, both of N.Y., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Feb. 24, 1982, Ser. No. 351,808
Int. Cl.³ H02M *1/18*
U.S. Cl. 363—57 **3 Claims**



1. In an array of thyristors serially connected and sharing a voltage common to said array, the thyristors being controlled independently and selectively for conduction by natural commutation under said common voltage, the provision of:

a plurality of capacitor means each associated individually with a corresponding one of said thyristors, said capacitor means being adapted to be charged under said common voltage when the associated thyristor is non-conductive, and adapted to be discharged through the associated thyristor when the latter is turned ON;

a like plurality of means responsive to a discharge condition of a corresponding one of said capacitor means for generating a representative pulse; and

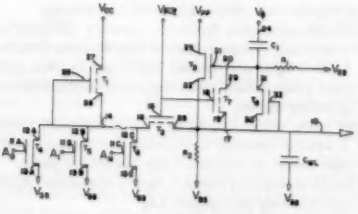
means responsive to the respective said representative pulses for detecting the absence of at least one of said representative pulses as an indication of thyristor failure under a shorted condition in one of the thyristors of said array.

4,442,481

LOW POWER DECODER CIRCUIT

Dhaval J. Brahmbhatt, San Jose, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 7, 1982, Ser. No. 366,441
Int. Cl.³ H02M *3/00*
U.S. Cl. 363—60 **24 Claims**



1. A system capable of providing a selected one of a plurality of voltage levels at a system output terminating region, said system comprising:

a pull up means having first and second terminating regions and a control terminating region, said pull up means being

capable of providing an effective electrical conductivity between said pull up means first and second terminating regions in response to electrical conditions at said pull up means control terminating region, said pull up means first terminating region being adapted to be electrically connected to a first voltage source and said pull up means second terminating region being electrically connected to a first electrical conductor means;

a first electrical coupling means for electrically coupling said first electrical conductor means to said system output terminating region;

a pumping means having first and second terminating regions and a control terminating region, said pumping means being capable of providing an effective electrical conductivity between said pumping means first and second terminating regions in response to electrical conditions at said pumping means control terminating region, said pumping means first terminating region being electrically connected to said pull up means control terminating region, said pumping means second terminating region being electrically connected to said first electrical conductor means, and said pumping means control terminating region being electrically connected to said first electrical conductor means;

a coupling capacitive means having first and second terminating regions, said coupling capacitive means first terminating region being adapted to be electrically connected to a second voltage source and said coupling capacitive means second terminating region being electrically connected to said pumping means first terminating region;

a maintaining means having first, second, and third terminating regions, said maintaining means first terminating region being electrically connected to said pull up means control terminating region, a selected one of said maintaining means second and third terminating regions being adapted to receive a first control signal, and the remaining one of said maintaining means second and third terminating regions being adapted to be electrically connected to a third voltage source, said maintaining means being adapted to maintain said maintaining means first terminating region at a first voltage level in response to a corresponding first control signal appearing at said selected one of said maintaining means first and second terminating regions.

4,442,482

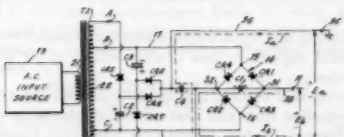
DUAL OUTPUT H.V. RECTIFIER POWER SUPPLY DRIVEN BY COMMON TRANSFORMER WINDING

George C. Gallios, Setauket, N.Y., assignor to Venus Scientific Inc., Farmingdale, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,449

Int. Cl.³ H02M 7/02

U.S. Cl. 363—61 **6 Claims**



1. A power supply including a transformer having magnetically coupled primary and secondary winding means; a rectifier-capacitor type first circuit energized by said secondary winding means to produce a first output voltage; a rectifier-capacitor type second circuit energized by said secondary winding means to produce a second output voltage referenced to said first output voltage; said first circuit including a first main capacitor across which said first output voltage appears and said second circuit including a second main capacitor across which said second output voltage appears; said secondary winding means including a common winding portion through which charging currents for both said first and second main capacitors flow; said charging current for said first main capacitor by-passing said second main capacitor; said charging current for said second main capacitor flowing through rectifier elements of said first circuit while by-passing said first main capacitor; said second circuit having a full wave voltage doubler type configuration.

4,442,483

RESONANT CIRCUIT INVERTER

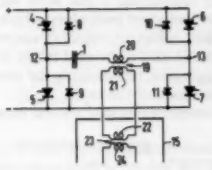
Heinz Baumann; Werner Kühnel, both of Uttenreuth, and Manfred Rattner, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,868

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139340

Int. Cl.³ H02M 7/537

U.S. Cl. 363—131 **1 Claim**



1. A resonant inverter circuit comprising:

an LC series resonant circuit;

a switch means for connecting said resonant circuit with periodically alternating polarity to a dc voltage source;

a high voltage transformer having a primary winding and a secondary winding; and

an interstage transformer interconnected between said resonant circuit and said high voltage transformer, said interstage transformer having a primary winding in said resonant circuit and a secondary winding connected to the primary winding of said high voltage transformer such that the primary voltage of said interstage transformer is twice stepped up, first to an intermediate voltage which is the primary voltage for said high voltage transformer and subsequently to the secondary voltage of said high voltage transformer at said secondary winding thereof, a load voltage being tapped at, said high voltage transformer secondary winding.

4,442,484

MICROPROCESSOR MEMORY MANAGEMENT AND PROTECTION MECHANISM

Robert H. E. Childs, Jr., Cupertino; Jack L. Klebanoff, Sunnyvale, both of Calif., and Frederick J. Pollack, Aloha, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 14, 1980, Ser. No. 197,052

Int. Cl.³ G06F 9/19

U.S. Cl. 364—200 **12 Claims**

1. For use in a data processing system having a memory for storing information which is classified into various categories called objects of said system, and a central processing unit connected to said memory,

said central processing unit including a protection mechanism having levels of privilege, wherein said central processing unit has access to tables stored in said memory, said tables containing object descriptors, said object descriptors providing controlled access to real memory space in said memory by a task (processing path) executing on said central processing unit,

each of said object descriptors being typed and assigned a

descriptor privilege level (DPL), such that access is allowed to some of said objects within said memory and access is denied to others of said objects within said memory, depending upon the descriptor privilege level assigned to said objects, the type assigned in the object descriptor, the type of operation requested in said executing task, and the current privilege level (CPL) of execution of said executing task,

said central processing unit comprising:

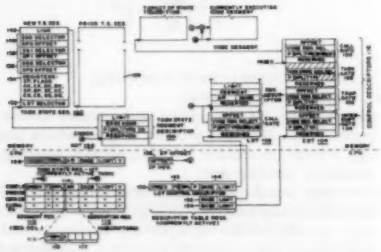
memory accessing means connected to said memory, said memory accessing means including memory address registering means for registering memory addresses for use by said memory in accessing said objects stored in said memory,

first means connected to said memory accessing means for registering first access information, said first access information providing first memory address information for locating said tables of object descriptors stored in said memory;

second means for registering a plurality of privilege levels, said privilege levels being assigned to a linearly ordered set of more privileged and lesser privileged levels;

third means for registering a task state segment, said task state segment including indicators which associated one or more of said tables of object descriptors with a task (processing path), said associated tables of object descriptors, in the aggregate, representing the entire set of objects in the address space of the task;

fourth means, connected to said second means, for registering a current privilege level (CPL) at any instant for a currently executing task, said current privilege level being a single unique member of said plurality of privilege levels registered in said second means, said CPL being based upon the progress of execution of said currently executing task;



fifth means for registering a segment selector, said segment selector including identifying means for uniquely identifying a particular object descriptor, said particular object descriptor being one of said object descriptors of said associated tables of object descriptors, within said address space of said task;

said fifth means including means for registering access rights information, said access rights information comprised of a number of bits of information, including descriptor privilege level bits (DPL) and type bits;

said type bits including bits for classification of said object descriptors into segment descriptors and control descriptors, said segment descriptors being permitted usage only for memory access and said control descriptors being permitted usage only for change of the operation path; and,

logic means connected to said third, fourth, and fifth means, said logic means including comparing means connected to said fourth means and to said fifth means for comparing said CPL and said DPL of said particular object descriptor,

said logic means including output means, connected as an input to said first means, for permitting access to said particular object indicated by said selector (registered in said said fifth means), by use of said first memory address information, said access being permitted only upon the condition that said access is from a more privileged current privilege level (registered in said fourth means) to the same or a less privileged level as specified by the DPL (registered in said fifth means) of said particular object descriptor.

4,442,485

DYNAMICALLY BUFFERED DATA TRANSFER SYSTEM FOR LARGE CAPACITY DATA SOURCE

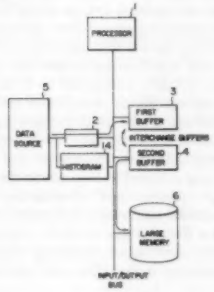
Hideo Ota, and Yutaka Kubo, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,403

Claims priority, application Japan, Dec. 7, 1979, 54-158065; Feb. 18, 1980, 55-17833

Int. Cl.³ G06F *3/04, 9/06*

U.S. Cl. 364—200 **18 Claims**



1. A data input/output method for transferring data between a large-capacity data source and a large-capacity memory connected to a processor by means of at least two buffer memories connected to said processor through an input/output bus, wherein the data transfer on the input/output bus is controlled by input/output control information decoded by a control section, said processor supplying a control register with said input/output control information having a command, a data count, a data address and a next-command address, comprising the steps of:

transmitting said input/output control information from said control register to said control section to be decoded therein;

supplying said control register with second input/output information from said next-command address in said input/output control information after said transmitting step;

transferring data up to the amount of said data count in said input/output control information through said input/output bus from or to one of said buffer memories on the basis of a result of said decoding;

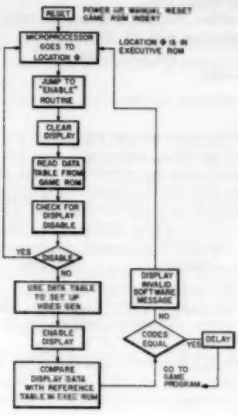
transmitting said second input/output information from said control register to said control section to be decoded therein after said data transfer; and

transferring data in accordance with said second input/output information from or to the other of said buffer memories.

4,442,486
PROTECTED PROGRAMMABLE APPARATUS

Robert T. Mayer, Rye, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 25, 1981, Ser. No. 324,744
Int. Cl.³ G06F *3/14, 13/00*
U.S. Cl. 364—200 **13 Claims**



1. Improved apparatus including computer equipment; program material including a plurality of instructions, part of which is a prescribed display instruction; said computer equipment being removably connectable to said program material; said computer equipment when connected to said program material operating to produce signals in accordance with said instructions; a display device responsive to said signals and producing displays in accordance therewith; said prescribed display instruction causing said computer equipment to produce signals which if received by said display device would cause it to produce a particular display; said computer equipment including means preventing said equipment from operating with program material not containing said prescribed display instruction, and wherein the improvement comprises a prescribed display instruction which produces a particular display including the phrase "This apparatus uses the invention of U.S. patent application entitled Protected Programmable Apparatus filed on Nov. 25, 1981 and any patent issuing thereon."

4,442,487
THREE LEVEL MEMORY HIERARCHY USING WRITE AND SHARE FLAGS

Robert P. Fletcher, Poughkeepsie; David M. Stein, Pleasantville, and Irving Wladawsky-Berger, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,521
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **10 Claims**

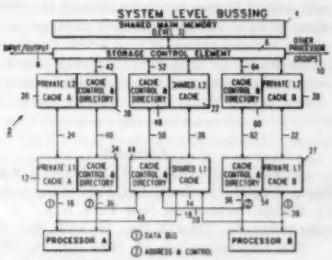
8. In a multiprocessor system, including a three level memory hierarchy, the combination comprising:

n processors, where n is an integer ≧2;

a main memory at memory level three, in which pages of information, each page comprised of a plurality of lines, are stored at addressable locations, with each page including a WRITE flag and a SHARE flag, with the state of the WRITE flag determining if each line in the page is writeable or read only by a processor, and the state of the SHARE flag determining if each line in the page is shareable or non-shareable by all processors, with each flag being set in a predetermined state;

a first shared cache at memory level two, which is operative with each of said n processors, including means for transferring a page of information from main memory to said first shared cache when the WRITE and SHARE flags are each in a given predetermined state, indicative of said page of information being both writeable and shareable;

a first set of n private caches at memory level two, with the first and second processors being exclusively operative with the first and second private caches, respectively, and the nth private cache being exclusively operative with the nth private cache, including means for transferring a page of information to one of said n private caches from main memory when at least one of the WRITE and SHARE



flags are not in said given predetermined state, indicative of a page not being both writeable and shareable;

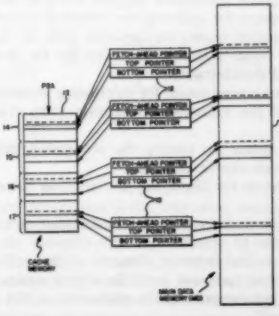
a second shared cache at memory level one, which is operative with each of said n processors, including means for transferring lines of information from said first shared cache to said second shared cache; and

a second set of n private caches at memory level one, with the first and second processors being exclusively operative with the first and second private caches, respectively, and the nth private cache being exclusively operative with the nth private cache, including means for transferring lines of information from the first set of n private caches to the second set of n private caches.

4,442,488
INSTRUCTION CACHE MEMORY SYSTEM

William E. Hall, Portland, Oreg., assignor to Floating Point Systems, Inc., Beaverton, Ohio

Continuation of Ser. No. 146,674, May 5, 1980, abandoned. This application Feb. 22, 1983, Ser. No. 468,506
Int. Cl.³ G06F *9/00, 13/00*
U.S. Cl. 364—200 **28 Claims**



1. In a memory system including a first memory means,

a higher speed memory means for receiving information

from said first memory means for storage and fast retrieval,

means for loading a first address location in said higher speed memory means with information from said first memory means in response to a first presentation of an address, which address is capable of accessing information in either memory means, said first address location being identified by said address,

means for substantially immediately outputting said information,

and means for bringing about repeated loading of further information into said higher speed memory means from said first memory means at further address locations consecutively beyond the first address location and in advance of further access to retrieve the further information, while retaining the loaded information in the higher speed memory means, at least within predetermined limits of the higher speed memory means, to provide a gradually expanding segment of information from said first memory means in said higher speed memory means for retrieval.

4,442,489

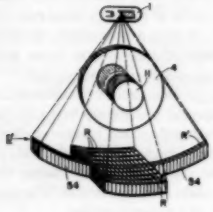
DEVICE FOR COMPUTED TOMOGRAPHY

Wolfgang Wagner, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 216,478, Dec. 15, 1980, Pat. No. 4,394,738. This application Feb. 18, 1983, Ser. No. 468,026

Int. Cl.³ A61B 6/00; G01N 23/00

U.S. Cl. 364—414 **2 Claims**



1. Computed tomography apparatus for determining a radiation absorption distribution in a planar examination zone within a slice of a body comprising:

radiation source means for generating a beam of penetrating radiation which irradiates the body from a plurality of directions in the plane of the slice;

detector means for measuring radiation in the beam which has passed through the body to supply absorption values which are a measure of radiation attenuation along measuring paths which pass through the body in the plane;

support means for retaining the radiation source means and the detector means on opposite sides of the body and which define a positioning zone for the body which is situated therebetween;

central processing means for calculating absorption coefficients of the radiation distribution from the absorption values;

memory means for storing the absorption values and the absorption coefficients; and

display means for displaying the radiation absorption distribution;

wherein, as an improvement, the detector means comprise:

a short row of detector elements disposed on the support means so that detector elements at the ends of the short row detect radiation from the source means along paths which are tangent to the perimeter of the examination zone; and

at least one long row of detector elements disposed parallel to the short row of detector elements, so that detector elements which are situated at the ends of the long row detect radiation from the source means along paths which are tangent to the perimeter of the positioning zone.

4,442,490

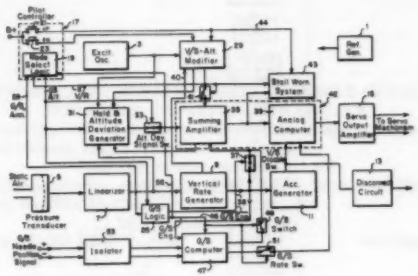
AIRCRAFT PITCH STABILIZATION APPARATUS

James E. Ross, Mineral Wells, Tex., assignor to S-Tec Corporation, Fort Walters, Tex.

Continuation of Ser. No. 191,263, Sep. 26, 1980, abandoned. This application Feb. 28, 1983, Ser. No. 468,803

Int. Cl.³ G06G 7/78

U.S. Cl. 364—433 **43 Claims**



1. A control apparatus to provide complete control of pitch of an aircraft in response to a command signal, comprising a gyroscopic free device having:

(a) means for producing an altitude signal responsive to atmospheric pressure;

(b) means derivative of atmospheric pressure responsive to rate of change of altitude for generating a vertical rate signal;

(c) means derivative of atmospheric pressure responsive to rate of change of said vertical rate signal for generating a vertical acceleration signal; and

(d) means for combining said command signal, said vertical rate signal and said vertical acceleration signal to produce said control signal.

4,442,491

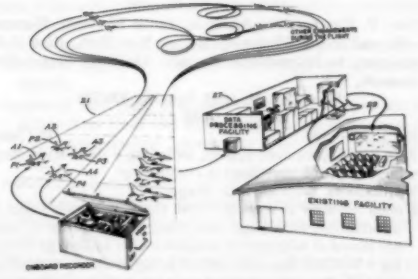
TRAINING EVALUATION PROCESS

James N. Olhausen, Jr., Benbrook, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Jun. 23, 1981, Ser. No. 276,650

Int. Cl.³ G06F 15/20

U.S. Cl. 364—454 **23 Claims**



1. A method of correcting data on an aircraft's position relative to the earth, said data being obtained during flight with an inertial navigation system (INS) on board said aircraft, comprising the steps of:

prior to commencing an aircraft engagement, determining the pre-engagement position of said aircraft relative to the earth independently of said INS,

at said pre-engagement position, operating said INS to obtain pre-engagement INS data on the position of said aircraft relative to the earth,

recording said pre-engagement INS data on position obtained by said INS at said pre-engagement position,

flying said aircraft in an engagement,

during said engagement of said aircraft continuing to operate said INS to obtain INS data on the position of said aircraft relative to the earth,

recording the INS data obtained on position during said engagement,

after the termination of said engagement by said aircraft, determining the post-engagement position of sad aircraft relative to the earth independently of said INS,

at said post-engagement position, operating said INS to obtain post-engagement INS data on the position of said aircraft relative to the earth,

recording said post-engagement INS data on position obtained by said INS at said post-engagement position,

comparing said independently determined pre-engagement position of said aircraft with the pre-engagement INS data on position to obtain pre-engagement error functions of position,

comparing said independently determined post-engagement position of said aircraft with the post-engagement INS data on position to obtain post-engagement error functions of position.

employing said pre-engagement error functions of position, said post-engagement error functions of position and the known time-variant drift characteristics of position of said INS to derive position correction functions during said engagement,

employing said position correction functions to correct the recorded INS data obtained on position during said engagement to obtain corrected INS data on position during said engagement, and

storing said corrected INS data on position.

4,442,492

DEVICE FOR CENTRAL READING AND REGISTRATION OF CUSTOMERS' POWER CONSUMPTION

Björn G. E. Karlsson, Fyrklöversgatan 125, Nödinge, Sweden (440 45), and Ingvar Jönson, Slottervallsgatan 9, Mölndal, Sweden (431 40)

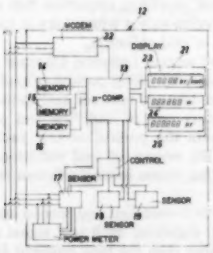
PCT No. PCT/SE80/00213, 371 Date Apr. 17, 1981, 102(e) Date Apr. 17, 1981, PCT Pub. No. WO81/00619, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 20, 1980, Ser. No. 255,240

Claims priority, application Sweden, Aug. 21, 1979, 7906983

Int. Cl.³ G01R *21/06;* G06F *15/20*

U.S. Cl. 364—464 **3 Claims**



1. A system for automatically reading and registering at a central location the consumption of a meterable quantity at least at one remote consumer location, wherein electric power distribution lines extend through said central and consumer location, said system comprising:

at said at least one consumer location:

modulator-demodulator means connected to said power distribution lines for receiving control signals from and transmitting data signals to said central location via said power distribution lines;

sensor means for measuring consumption of said meterable quantity at said each consumer location;

storage means for storing a selectively modifiable current billing rate charged for consumption of said meterable quantity;

means responsive to reception of a first predetermined control signal at said modulator-demodulator means for changing the current billing rate stored in said storage means;

accumulator means for accumulating data representing the amount of said meterable quantity measured at said sensor means;

means responsive to reception of a second predetermined control signal at said modulator-demodulator means for transmitting via said power distribution lines data signals representing the accumulated data in said accumulator means and for resetting the accumulator means; and

indicator means for providing an indication of the current billing rate stored in said storage means;

at said central location:

means for selectively transmitting said first and second predetermined control signals to said consumer location via said power distribution lines; and

means for receiving data signals transmitting from said consumer location via said power distribution lines.

4,442,493

CUTTING TOOL RETREAT AND RETURN FOR WORKPIECE PROTECTION UPON ABNORMALITY OCCURRENCE IN A PREPROGRAMMED MACHINE TOOL

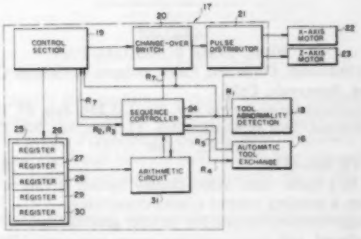
Hideyuki Wakai; Masataka Kashimoto; Chiaki Sakamoto, and Eiji Mizutani, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,033

Claims priority, application Japan, Jul. 4, 1980, 55-91368; Jul. 4, 1980, 55-91369

Int. Cl.³ G06F *15/46;* G05B *19/18*

U.S. Cl. 364—475 **11 Claims**



1. A method for automatically retreating and returning a cutting tool of a numerically controlled machine tool comprising:

a step for retreating said cutting tool, when an abnormality arises in said cutting tool, into a first position, said retreat being in a direction and by a distance corresponding to a predetermined computational parameter selected in accordance with the type of machining operation to be performed on a workpiece; and

a step for returning said cutting tool, after resolution of the

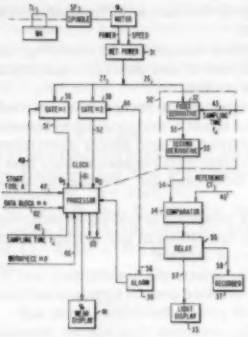
cutting tool abnormality, via said first position into a second position determined by said parameter, said second position being such that machining of the workpiece is resumed to overlap a determined area machined prior to the occurrence of the cutting tool abnormality.

4,442,494

TOOL WEAR AND TOOL FAILURE MONITOR SYSTEM

Robert E. Fromson, Wilkins Township, Allegheny County, and Lanson Y. Shum, Salem Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 18, 1981, Ser. No. 322,619
Int. Cl.³ G06F *15/46*; G01N *19/02*
U.S. Cl. 364—511 **5 Claims**



3. A numerical controlled machine tool for operating a plurality of tools with a plurality of workpieces comprising:

means associated with each of said tools in operation with a corresponding workpiece for deriving respective instantaneous values of net power applied to operate a given tool with a given workpiece;

central processor means for deriving the second derivative of net power for each of said instantaneous values;

comparator means responsive to each of said instantaneous values and for each of said tools for deriving a critical signal when the second derivative exceeds a reference level;

diagnostic means for determining with said comparator means and in response to a critical signal therefrom, any of said tools should be maintained.

4,442,495

REAL TIME TOROIDAL PAN

Josef Sukonick, Cupertino, Calif., assignor to Cadtrak Corporation, Sunnyvale, Calif.

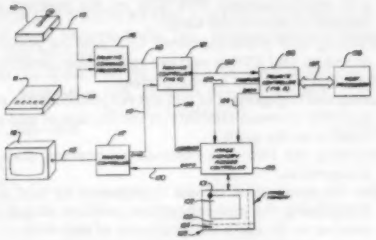
Continuation-in-part of Ser. No. 125,238, Feb. 27, 1980, abandoned. This application Jun. 17, 1981, Ser. No. 274,355
Int. Cl.³ G06F *3/153*
U.S. Cl. 364—521 **28 Claims**

1. In a raster scan video display system having a display device, a panning control system comprising:

image memory means for storing graphic data to be displayed, said image memory means being capable of storing more graphic data than can be simultaneously displayed on said display device, said image memory means being accessible in accordance with a specified coordinate system having defined coordinate boundaries;

raster readout control means for reading out graphic image data from a portion of said image memory means in raster scanning order and in synchronism with the video timing of said display device beginning at an arbitrarily specifiable origin address, said control means recognizing during raster readout when a coordinate boundary is reached and continuing said readout from the corresponding opposite boundary, the read out image data being translatable into a video graphics signal to said display device; and

rewrite means for entering data into an area of said image



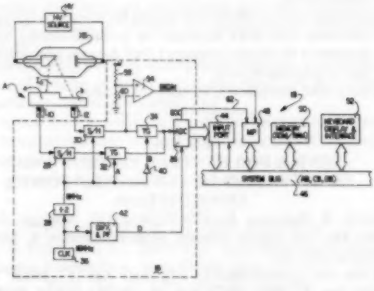
memory means outside of the portion from which said data is read out, so that said entered data will be available for inclusion in the read out image data upon subsequent raster readout from a different origin address.

4,442,496

RADIATION ENERGY MEASUREMENT APPARATUS

William E. Simon, Cleveland, and Richard D. Richards, Bay Village, both of Ohio, assignors to Victoreen, Inc., Cleveland, Ohio

Continuation of Ser. No. 173,661, Jul. 29, 1980, abandoned. This application Dec. 3, 1982, Ser. No. 446,501
Int. Cl.³ G01D *18/00*
U.S. Cl. 364—524 **6 Claims**



1. Apparatus for determining the peak energy of radiation being emitted by a radiation source whose output radiation energy varies with time in a cyclical manner, comprising:

at least fire and second radiation detector means adapted to be disposed in the path of radiation emitted by said radiation source for providing respective first and second analog signals having values which vary in known relation to the intensity of said radiation;

at least first and second radiation absorber means for each absorbing a corresponding portion of said radiation, each adapted to be disposed between said radiation source and a corresponding one of said first and second detector means, wherein the portion of said radiation absorbed varies with the energy of said radiation, said first and second absorber means having different radiation absorption values;

means responsive to said first and second analog signals for sampling and digitizing each said signal at regular time intervals smaller than the time required for the radiation level to vary substantially, so as to thereby provide first and second digital signals, each having digital values which represent and vary with a corresponding one of said first and second analog signals;

digital memory means for storing the digital values of each of said digital signals taken over a plurality of cycles of said radiation energy; and

computer means for digitally processing said stored digital values to determine the peak energy level of said radiation.

4,442,497

MEASURING SYSTEM FOR ALIGNMENT AND MEASUREMENT WITH AN ELECTRONIC TACHYMETER

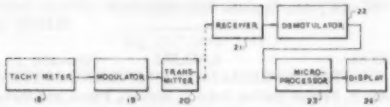
Hermann Göring, Jena; Peter Hentschel, and Wolfgang Meyl, both of Dresden, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Continuation-in-part of Ser. No. 69,944, Aug. 27, 1979, Pat. No. 4,321,683. This application May 28, 1981, Ser. No. 267,831

Claims priority, application German Democratic Rep., May 25, 1978, 205575

Int. Cl.³ G01C *3/08;* G01B *11/26*

U.S. Cl. 364—561 5 Claims



1. A measuring device for aligning and measuring points in a terrain, comprising an electronic tachymeter system and a reflector system, said tachymeter system comprising range finding means for providing output signals corresponding to the position of the reflector system, in a given coordinate system, computer means for calculating the difference between the position of said reflector system and a second position of known coordinates, and electromagnetic energy transmitting means for transmitting signals corresponding to said difference to said reflector system, said reflector system comprising receiving means for receiving said signals, and display means for visually displaying said difference, in response to said signals.

4,442,498

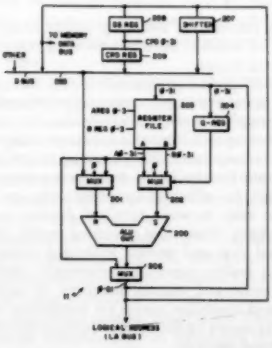
ARITHMETIC UNIT FOR USE IN DATA PROCESSING SYSTEMS

Josh Rosen, 9A Lincoln St., Westboro, Mass. 01581

Filed Apr. 23, 1981, Ser. No. 256,726

Int. Cl.³ G06F *7/48*

U.S. Cl. 364—745 5 Claims



1. In a data processing system, an arithmetic logic unit for performing floating point arithmetic which requires unbiased rounding of the floating point arithmetic result, said unit comprising

means for computing an unrounded floating point result comprising a plurality of bit groups, a first selected number of said bit groups being used to form the rounded floating point result and a second selected number of said bit groups being used to determine the round bit for said rounded result;

a plurality of look-ahead logic means for generating carry bits, for insertion into selected ones of said bit groups of said unrounded floating point result, substantially simultaneously with the computation of said unrounded floating point result;

means responsive to said second selected number of bit groups of said unrounded floating point result for determining said round bit;

a portion of a selected one of said look-ahead logic means being responsive to said round bit for inserting said round bit into the least significant bit group of said first selected number of bit groups substantially simultaneously with the insertion of the carry bits into the remaining bit groups of said first selected number thereof to produce said rounded floating point result.

4,442,499

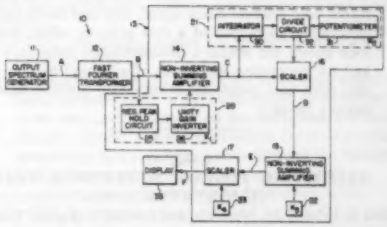
DEVICE AND METHOD FOR PRODUCING PNEUMATIC TIRES HAVING PRESELECTED NOISE CHARACTERISTICS

Paul J. Sekula, Mogadore, Ohio, and Gerald R. Potts, Edina, Minn., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 199,678, Oct. 22, 1980, abandoned. This application Feb. 2, 1982, Ser. No. 345,195

Int. Cl.³ B60C *11/10*

U.S. Cl. 364—574 16 Claims



1. A device for producing a design element pattern of a preselected total length for a load supporting apparatus, the apparatus having a preselected, periodic audio frequency spectrum signal, the design element pattern including a plurality of individual design elements of varying lengths, the device comprising:

means for generating the preselected audio frequency spectrum signal;

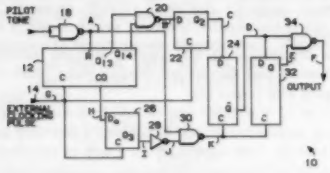
means receiving the preselected, periodic audio frequency spectrum signal and generating an inverse Fourier transform signal thereof; and,

circuit means receiving said inverse Fourier transform signal and generating a periodic signal the period of which is substantially proportional to the preselected total length for the design element pattern and the relative amplitude of which at various points in time throughout one period is substantially proportional to the length of the individual design elements at similarly spaced locations over the preselected total length for the design element pattern.

4,442,500
NARROW BAND DIGITAL FILTER

Lowell S. Kongable, Paradise Valley, Ariz., and Clint E. Bauer, Kaysville, Utah, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 16, 1981, Ser. No. 312,062
Int. Cl.³ H04B *1/16*
U.S. Cl. 364—724 **15 Claims**



10. A digital filter for activating circuitry of a stereo AM radio receiver, having a first input means adapted to receive pilot tone pulses of a transmitted stereo AM signal, said pulses having a period which may vary, and a second input means adapted to receive a clock signal from circuitry within said stereo AM radio receiver, said filter comprising:

timing means coupled to said first and second input means and responsive to said pilot tone pulses and said clock signal for generating a first signal having a first and a second state, said first state corresponding to a period of time within a predetermined range and for generating a second signal coincident with the end of said period of time;

first delay means coupled to said timing means and to said second input means and responsive to said second signal and said clock signal for delaying said second signal;

circuit means coupled to said first delay means and to said first input means and responsive to said delayed second signal and said input signal for generating an internal clock signal; and

logic means coupled to said timing means, said circuit means and said second input means and responsive to said first signal, said internal clock signal, and said clock signal for generating an output of a first polarity when said pilot tone pulses are within a predetermined frequency range and for generating an output of a second polarity when said pilot tone pulses are outside said predetermined frequency range.

4,442,501
ELECTRONIC POSTAGE METER WITH WEAK MEMORY INDICATION

Alton B. Eckert, Jr., Norwalk, and Edward C. Duwel, Trumbull, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 26, 1981, Ser. No. 238,330
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **14 Claims**

1. An accounting section for an electronic postage meter, comprising:

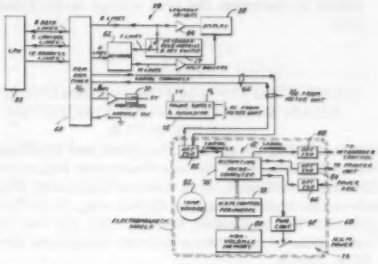
a nonvolatile memory having a plurality of normal data fields and a predetermined data field;

means for exercising said predetermined data field by erasing any data therein and writing a predetermined value therein;

computer means communicatingly connected to said nonvolatile memory for determining the data retention condition of said predetermined data field during a power-up cycle of the meter by reading said predetermined retention data field on every power-up cycle of said meter while reading a different one of said normal data fields on each power-up cycle, so that said predetermined retention data field is purposely cycled and degraded faster than said normal data fields;

means for establishing a constant value;

means for storing a value which results from a reading of said predetermined data field by said computer means; and

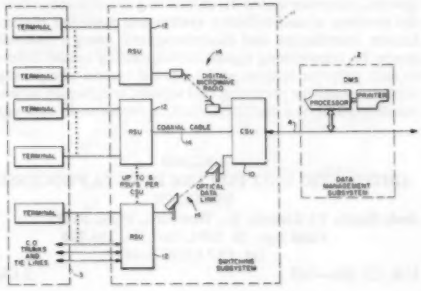


means for generating a signal when said stored value fails to correspond to said constant value obtained from a reading of said predetermined data field.

4,442,502
DIGITAL INFORMATION SWITCHING SYSTEM

George E. Friend, Dallas; John D. Meyers, Plano, and Steve Van Dyke, Dallas; James R. Carreker, San Antonio, all of Tex., assignors to Datapoint Corporation, San Antonio, Tex.

Filed Mar. 3, 1981, Ser. No. 248,821
Int. Cl.³ G06F *11/20, 3/04*
U.S. Cl. 364—900 **29 Claims**



1. A digital information switching system comprising

a plurality of terminal devices providing respective digital information signals;

a plurality of processor controlled first switching means each connected to a respective group of terminal devices for effecting interconnection between the devices connected thereto on a time slot exchange basis;

a second processor controlled switching means connected to each of said first switching means via a respective inter-switch link for effecting interconnection on a time slot exchange basis between terminal devices connected to different ones of said first switching means; and

each of said first and second switching means including switching matrix means for selectively interconnecting inputs thereto and outputs therefrom by time slot interchange and controller means for controlling said switching matrix means on the basis of control information from said terminal devices;

wherein said controller means in each of said first and second switching means comprises a plurality of devices including a system processor, a random access memory device and a bus interface circuit connected in parallel to a controller bus for effecting transfer of address and data

signals between said devices, said first and second switching means each further including terminal bus means for connecting said bus interface circuit to said switching matrix means for effecting control thereof by said system processor, maintenance processor means connected to said controller bus for detecting failure of a device connected to said controller bus and transmission means connected to said maintenance processor means for automatically transmitting data to a remotely-located service center identifying said failure.

4,442,503
DEVICE FOR STORING AND DISPLAYING GRAPHIC INFORMATION

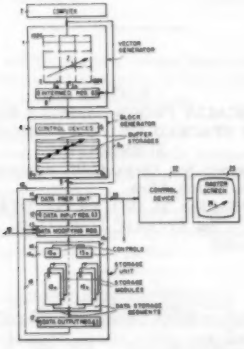
Dieter Schütt, Munich; Manfred Schwengler, Sindelfingen; Hartmut Ulland, Stuttgart, and Helmut H. Weis, Waldenbuch, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1981, Ser. No. 254,711

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015125

Int. Cl.³ G06F *3/14*

U.S. Cl. 364—900 **12 Claims**



1. In a device for storing and displaying graphic information with a raster display having an image field, a storage unit comprising:

a plurality of storage modules, each for storing one of a plurality of elements of a plurality of information blocks, each of said plurality of elements representing a row of the image field;

a storage control for addressing said storage modules in a two-dimensional manner, such that (a) said plurality of elements of each of said plurality of information blocks are stored in successive ones of said storage modules, and that (b) the rows of the image field are stored in the modules in such a manner that storage locations of the same address within each of said plurality of storage modules store a row of the image field; and

a data preparation unit receiving the graphic information and communicating with said storage control, said data preparation unit aligning the graphic information prior to storage in said plurality of storage modules and aligning in the inverse order graphic information from said plurality of storage modules prior to transferral to the raster display, said data preparation unit comprising a register whose capacity corresponds to at least the size of one of said plurality of information blocks, said register having a feedback for cyclic shifting.

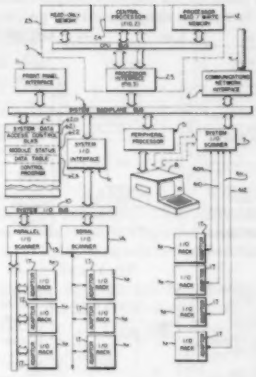
4,442,504
MODULAR PROGRAMMABLE CONTROLLER

Ernst H. Dummermuth, Chesterland; Daniel J. Galdun, Huntsburg; Raymond A. Grudowski, South Euclid, and Daniel L. Stewart, Parma, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 241,723, Mar. 9, 1981, abandoned. This application Oct. 21, 1981, Ser. No. 313,365

Int. Cl.³ G06F *7/00, 9/30*

U.S. Cl. 364—900 **17 Claims**



1. A programmable controller which comprises:

a backplane bus having leads for conducting data signals, leads for conducting address signals, and leads for conducting control signals;

a memory module connected to the leads in the backplane bus for conducting data, address and control signals and including means for storing a control program comprised of a set of macroinstructions, and means for storing a data table;

a CPU module connected to the leads in the backplane bus for conducting data, address and control signals and including

(a) CPU arbitration means for obtaining access to the backplane bus,

(b) fetch means coupled to the CPU arbitration means and being responsive to a FETCH signal to generate address and control signals on the backplane bus and to thereby obtain a macroinstruction from the control program in said memory module through the backplane bus and store it in a macroinstruction register,

(c) memory means for storing an I/O image table,

(d) CPU processor means coupled to said fetch means, said memory means and said CPU arbitration means, said processor means being operable to repeatedly execute the control program by sequentially executing macroinstructions in said macroinstruction register and generating FETCH signals to said fetch means, and in doing so, to read and write data to the I/O image table in said memory means and to read and write data to the data table in said memory module through said CPU arbitration means and said backplane bus.

4,442,505
CONTROL DEVICE OF COPYING MACHINE

Shouji Takano, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 20, 1981, Ser. No. 323,557

Claims priority, application Japan, Nov. 28, 1980, 55-167436

Int. Cl.³ G06F *9/06*; G03G *15/00*

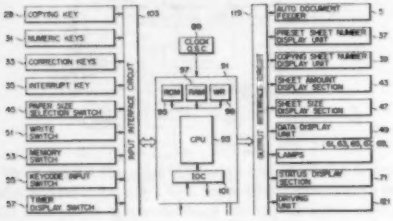
U.S. Cl. 364—900 **3 Claims**

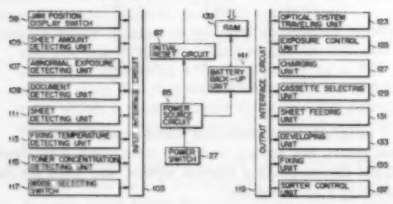
1. A control device of a copying machine wherein said

control device is capable of actuating a plurality of processing components, including an automatic document feeder, a semi-automatic document feeder and a sorter, to continuously perform automatic copying with time sequence, comprising:

(A) means for setting copying conditions, including selection between said automatic document feeder and said semi-automatic document feeder, and a copying sheet number, based on the copying conditions;

(B) memory means for storing the copying conditions and





the copying sheet number set by said setting means in correspondence with each other;

(C) means for judging if the number of copies produced has reached the copying sheet number which is stored in said memory means; and

(D) control means for reading out a copying condition from said memory means according to judging results obtained by said judging means, and including means for executing a copying operation based on said read out copying condition.

4,442,506

PORTABLE WORD-PROCESSOR

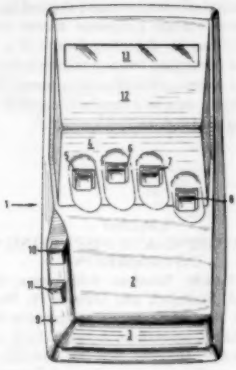
Cyril Endfield, London, England, assignor to Microwriter Limited, London, England

Division of Ser. No. 188,571, Sep. 18, 1980, Pat. No. 4,360,892, which is a continuation-in-part of Ser. No. 13,824, Feb. 22, 1979, abandoned. This application Jun. 14, 1982, Ser. No. 388,266

Int. Cl.³ G06F *3/023*

U.S. Cl. 364—900 **9 Claims**

1. A hand portable word-processor which can be held by one of an operator's hands to be operated only by the other hand or supported against a surface for operation only by one hand, comprising a manually operable input keyboard having four non-thumb finger keys and a first thumb key, means responsive to operation of the first thumb key and the non-thumb keys for generating different coded character signals each representing a different character in a particular alphabetic system, the number of said coded signals which are generatable by operation of said keys greatly exceeding the number of the keys themselves, a casing supporting said means and said keyboard, a microprocessor forming a part of said means, and a second thumb key forming a part of said keyboard and operable with pre-selected ones of said non-thumb finger keys to supply process instructions to said microprocessor to process said coded character signals, said first and second thumb keys



and said non-thumb keys being positioned on said casing for operation with a single hand.

4,442,507

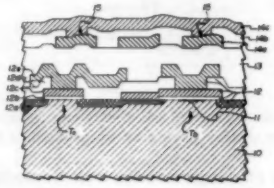
ELECTRICALLY PROGRAMMABLE READ-ONLY MEMORY STACKED ABOVE A SEMICONDUCTOR SUBSTRATE

Bruce B. Roesner, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 23, 1981, Ser. No. 237,428

Int. Cl.³ G11C *11/40, 11/36*

U.S. Cl. 365—100 **12 Claims**



1. An electrically programmable read only memory having memory cells on an insulating layer which overlies a semiconductor substrate; each of said memory cells comprising:

a first semiconductor material having a polycrystalline grain structure;

a metallic compound in contact with said first semiconductor material forming a Schottky diode therewith; and

a second semiconductor material serially coupled within said cell to said Schottky diode; said second semiconductor material consisting essentially of a single element semiconductor selected from the group of Si, Ge, C, and α-Sn, having a crystalline grain size which is smaller than that of said polycrystalline semiconductor material, and having a concentration of dopant atoms of less than 10^{17} atoms/cm^3;

whereby said second semiconductor material will exhibit a high resistance that will irreversibly switch to a low resistance without the flowing of any metal therethrough upon the application of a threshold voltage thereacross.

4,442,508

STORAGE CELLS FOR USE IN TWO CONDUCTOR DATA COLUMN STORAGE LOGIC ARRAYS

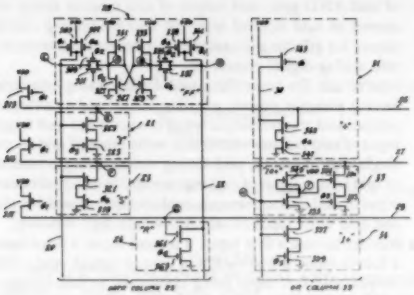
William Knapp, Chandler; William Dunn, Scottsdale, both of Ariz., and Kent F. Smith, Salt Lake City, Utah, assignors to General Instrument Corporation, New York, N.Y.

Filed Oct. 16, 1981, Ser. No. 311,925

Claims priority, application United Kingdom, Aug. 5, 1981, 8123966

Int. Cl.³ G11C *17/00, 11/40*

U.S. Cl. 365—104 17 Claims



1. A storage cell for use in a storage logic array having a plurality of columns and a plurality of rows interconnecting the columns, said storage cell comprising:

a pair of data column conductors;

a memory element;

means for transferring data from said memory element to said data column conductors upon activation by a clock pulse during a first time period; and

means for transferring data to said memory element from said data column conductors upon activation by a clock pulse during a second time period.

4,442,509

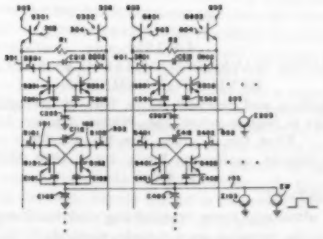
BIT LINE POWERED TRANSLINEAR MEMORY CELL

William H. Herndon, Sunnyvale, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Oct. 27, 1981, Ser. No. 315,679

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—154 14 Claims



14. A memory cell circuit comprising:

a word line;

a pair of bit lines;

a first and a second NPN transistor, each having a base, and an emitter, and a collector, the first emitter and the second emitter being coupled to the word line, the first base being coupled to the second collector and the second base being coupled to the first collector;

a first diode coupled between one of the bit lines and the first base, and a second diode coupled between the other bit line and the second base;

a first capacitance coupled between the base and the emitter of the first transistor and a second capacitance coupled between the base and the emitter of the second transistor;

a third capacitance coupled between the collector of the first transistor and the collector of the second transistor;

a fourth capacitance coupled between the word line and ground potential;

a first resistance coupled between the bit lines; and

means for applying electrical signals to each of the bit lines and the word line.

4,442,510

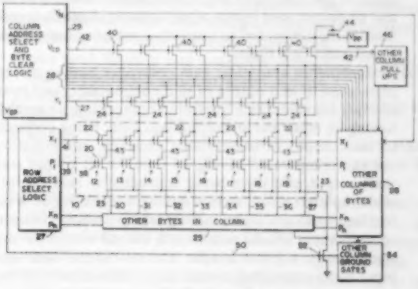
SEMICONDUCTOR MEMORY BYTE CLEAR CIRCUIT

Ury Priel; Giora Yaron, both of Cupertino, and Mark S. Ebel, Santa Clara, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 28, 1981, Ser. No. 334,698

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—218 10 Claims



1. Apparatus to permit clearing individual bytes in an electrically alterable read-only memory of the type having a clear signal generating means for generating a clear signal, a row and column address select means, and an array of rows and columns of bytes, each byte comprising a plurality of storage cells, each of which cells include at least one switching device that can be cleared by the application of said clear signal thereto, said switching device connected between a ground line and an output line, comprising:

ground isolating means, operable in response to the reception of a first signal, to isolate the ground lines for the switching devices in the bytes in one column from the ground lines for the switching devices in the bytes of the other columns;

first connecting means, operable in response to the reception of a second signal, to connect the output lines for the switching devices in the bytes in said one column to the clear signal generating means;

a clear prevention signal generating means for generating a clear prevention signal; and

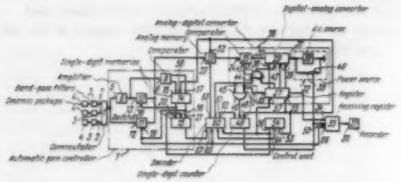
second connecting means, operable in response to the reception of a third signal, to connect said output lines for the switching devices in the bytes in said columns to the clear prevention signal generating means, said clear signal being sufficient to overcome said clear prevention signal when both said clear signal and said clear prevention signal are applied to said output lines.

4,442,511

DIGITAL OUTPUT TELEMETERING SYSTEM FOR RECORDING SEISMIC SIGNALS

Vadim V. Meer; Vladimir I. Nesterov, and Boris G. Lapshin, all of Ryazan, U.S.S.R., assignors to Ryazansky Radiotekhnichesky Institut, Ryazan, U.S.S.R.

Filed Aug. 31, 1981, Ser. No. 298,336
Int. Cl.³ G01V 1/22
U.S. Cl. 367—78 4 Claims



1. A digital output telemetering system for recording seismic signals, comprising:

a group of seismic pickups each of which having an output;

a group of seismic signal band-pass filters in a number equal to the number of said seismic pickups, each of said filters having an output, and an input connected to said output of a respective seismic pickup;

a seismic channels commutator having inputs in a number equal to the number of said seismic signal band-pass filters, and an output, said inputs of said seismic channels commutator being connected to respective outputs of said seismic signal band-pass filters;

an instantaneous automatic gain controller having an input connected to said output of said commutator, said instantaneous automatic gain controller comprising: an amplifier having an input and an output, said input being connected to said output of said seismic channels commutator; a voltage comparator having an input, a set output and a reset output, said input being connected to said output of said amplifier; a first switch having a signal input, a control input and an output, said signal input being connected to said output of said amplifier; a second switch having a signal input, a control input and an output, said signal input being connected to said output of said seismic channels commutator; a first single-digit memory having a set input, a reset input, a write input, a reset output and a set output, said reset and set inputs being respectively connected to said reset and set outputs of said voltage comparator, said reset output being connected to said control input of said first switch, and said set output being connected to said control input of said second switch; a second single-digit memory having a reset input, a set input, a write input, and an output, said reset and set inputs being respectively connected to said reset and set outputs of said first single-digit memory;

an analog memory having a signal input, a first control input, a second control input, and an output, said signal input being connected to said output of said first switch and to said output of said second switch, said first control input being connected to said write input of said first single-digit memory;

an analog-digital converter comprising: a comparator having a signal input, an input and a logic output, said signal input being connected to said output of said analog memory; a digital-analog converter having digital inputs, a calibrating input, an analog input, and an output, said output being connected to said input of said comparator; a calibrating current source serving as a power source of the digital-analog converter and having a control input and an output, said output being connected to said analog input of said digital-analog converter; a register having a trigger input, a setting input, a control input connected to said logic output of said comparator, and a group of digital outputs which are connected to respective digital inputs of said digital-analog converter; an OR gate having a first input, a second input, and an output, said first input being connected to a digital output of said group of digital outputs of said register, said output being connected to said calibrating input of said digital-analog converter;

an AND gate having a first input, a second input, and an output, said first input being connected to said second input of said OR gate, said second input of said AND gate being connected to said logic output of said comparator;

a counter having a count input, a reset input, a set input, and an output, said count input being connected to said output of said AND gate, said output of said counter being connected to said control input of said calibrating current source for effecting instantaneous automatic calibration of said analog-digital converter;

a control unit for controlling said digital-analog converter, having a trigger output, a setting output and a calibrating output, said trigger output being connected to said trigger input of said register and to said write input of said second single-digit memory, said setting output being connected to said setting input of said register and to said first control input of said analog memory, said set input of said counter, and said write input of said first single-digit memory;

a decoder having a first input, a second input, a third input, a fourth input, a first output, a second output, and a third output, said first input being connected to said output of said second memory, said second input being connected to said set output of said first single-digit memory, said third input being connected to said calibrating output of said control unit, said fourth input being connected to said trigger output of said control unit, said first output being connected to said second control input of said analog memory, said second output being connected to said first input of said AND gate and said second input of said OR gate, said third output being connected to said reset input of said counter;

a receiving register having a first input, a second input, a third input, and an output, said first input being connected to said digital outputs of said register, said second input being connected to said output of said counter, said third input being connected to said set output of said first signal-digit memory; and

a recorder having an input connected to said output of said receiving register.

4,442,512

ULTRASONIC WAVE TRANSMITTING AND RECEIVING DEVICE FOR VEHICLES

Masao Kodera, and Sigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 17, 1981, Ser. No. 255,275
Claims priority, application Japan, Jul. 1, 1980, 55-93372[U]
Int. Cl.³ G01S 15/93
U.S. Cl. 367—87 1 Claim

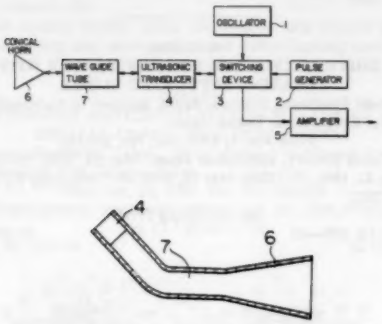
1. An ultrasonic wave transmitting and receiving device adapted to be mounted on a vehicle, particularly at the rear end portion of said vehicle, said device having an ultrasonic transducer adapted for transmitting an ultrasonic transducer wave which is an attenuated oscillation when a pulse is generated and for receiving an echo reflected by an obstruction, characterized by comprising:

a horn opening rearwardly from said vehicle;

an ultrasonic transducer attached to said vehicle at a position spaced in the forward direction of said vehicle from a rear bumper; and

a waveguide tube connecting to said ultrasonic transducer

and said horn, said waveguide tube being long enough to sufficiently lower the level of the attenuated oscillation of



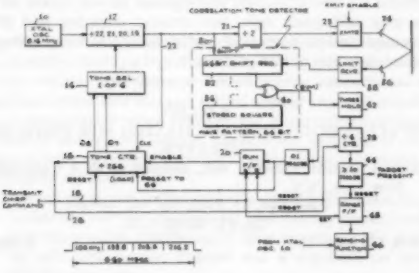
the pulse ultrasonic wave and being bent at a predetermined radius of curvature.

4,442,513

SONAR TRANSCEIVER SYSTEM AND METHOD

Ronald C. Mead, Van Nuys, Calif., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 5, 1982, Ser. No. 345,987
Int. Cl.³ G01S *15/14, 7/66*
U.S. Cl. 367—100 **14 Claims**



1. A sonar transceiver system including transducer means for transmiting and receiving sonar signals in the water, including means for generating chirp-like electrical signals connected to said transducer, means to convert said electrical signals to acoustic transmitted signals and means for receiving echo signals including said transducer means and a correlator for correlating the received signals with the transmitted signals and which responds to a recognized correlation by producing an output signal, characterized in that said system includes:

(a) means including said transducer means for generating and transmitting sonar signals consisting of a plurality of n ultrasonic tones closely spaced in frequency and consecutive such as to form a pseudo chirp pulse,

(b) means for receiving and detecting echo signals including said transducer means, and a receiver including hard limiting means for converting said received signals into binary signals,

(c) a shift register for receiving said binary signals,

(d) clock means connected to said shift register for processing samples of said binary signals through said register for a predetermined number of counts at a rate corresponding to the frequency of the first of said tones,

(e) storage means for storing a binary wave pattern corresponding to said transmitted tones as limited,

(f) correlation means comprising said received binary signals with said stored pattern and producing an output signal when said shift register binary signal and said stored pattern reach a desired correlation,

(g) means responsive to the occurence of said output signal to reset said clock to change the rate of sampling said received binary signals in said shift register to correspond to the frequency of the second of said tones, said correlation means then comparing said received binary signals with said stored pattern and producing a second output signal when said shift register binary signal and said stored pattern reach a desired correlation,

(h) means responsive to the completion of the number of counts of said clock means at each of said second and subsequent output signals to the nth output signals for successively resetting said clock to change the rate of processing said binary signals in said shift register to correspond to the frequencies of said second and successive tones to the nth tone, said correlation means producing an output signals each time said shift register binary signal and said stored pattern reach a desired correlation,

(i) circuit means determining whether said output signals represent the reception of said tones in the proper order as transmitted, and

(j) majority test means responsive to the occurence of a desired majority of said "n" tones and providing an output if said desired majority of tones is present.

10. A system for correlating a series of uniform alternating current signals closely spaced in frequency and consisting of first through nth tones with unknown alternating current signals believed to contain said tones comprising,

means hard limiting said unknown alternating current signals to produce a series of binary signals,

a shift register including a clock terminal for clocking samples of said binary signals therethrough,

a storage register for storing a pattern of binary signals corresponding to the pattern of a sine wave as hard limited,

programmable counter means connected to said clock terminal for providing variable frequency clock pulses to said shift register, the frequencies of said clock pulses corresponding to the order of said first through nth tones,

comparator circuit and summing means connected to said shift register and said storage register for continuously comparing the binary signals thereon and for producing output signals of a desired magnitude upon the occurence of correlations between said binary signals,

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4,442,514

SECURITY SYSTEM SIGNAL PROCESSOR

Roger R. Roth, Minnetonka, Minn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 17, 1981, Ser. No. 329,560
Int. Cl.³ G08B *13/00*
U.S. Cl. 367—136 **7 Claims**

1. In combination with a security system having transducer means responsive to intrusion event detection, a signal processor comprising:

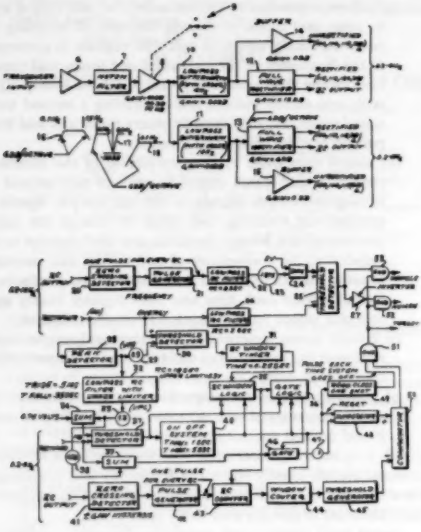
a signal conditioning circuit receiving transducer means output signals and developing therefrom rectified and unrectified high pass frequency signals and rectified and unrectified low pass frequency signals,

an intrusion type identification circuit receiving said rectified and unrectified high pass frequency signals and developing therefrom signals representing human intrusions and signals representing vehicle intrusions,

an intrusion event detection circuit receiving said rectified and unrectified low pass frequency signals and said rectified high pass frequency signal and developing therefrom discrete intrusion event signals, and

a classification logic circuit receiving said intrusion event

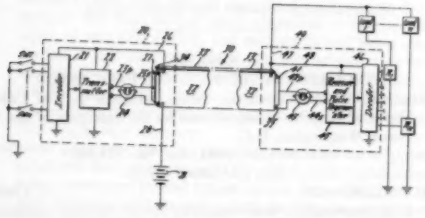
signals, said signals representing human intrusions and said signals representing vehicle intrusions and providing output signals in response to human intrusion events and output signals in response to vehicle intrusion events.



4,442,515
MULTIPLEX TRANSMISSION MEDIUM FOR APPLICATION IN MULTIPLEX VEHICLE CONTROL SYSTEMS

Allen H. Meitzler, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 17, 1981, Ser. No. 331,721
Int. Cl.³ B60Q *1/26*
U.S. Cl. 367—197 **11 Claims**



1. An electrical control system for command switching and controlling a plurality of remotely located electrical devices from a command station including:

means for supplying electrical power to said system;

means for converting commands from said command station to corresponding coded ultrasonic control signals;

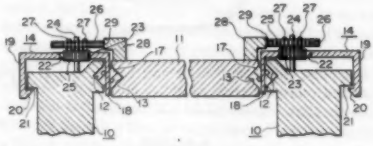
means connected to each of said electrical devices for receiving said ultrasonic control signals and switching said electrical power to an appropriate electrical device according to said code; and

means interconnecting said command station, said electrical supply means, said converting means, said electrical devices and said receiving and switching means, for transmitting both said ultrasonic control signals and said electrical power, wherein said transmission means comprises a unitary strip of material having low resistance to both electrical current conduction and to stress wave propagation.

4,442,516
DRIVE MECHANISM FOR DISC PLAYER WITH BEARING SUPPORTED SLIDER

Tadashi Funabashi, Saitama, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 269,163
Claims priority, application Japan, May 31, 1980, 55-72919; May 31, 1980, 55-72920; May 31, 1980, 55-72921; May 31, 1980, 55-72922
Int. Cl.³ G11B *21/08*
U.S. Cl. 369—43 **16 Claims**

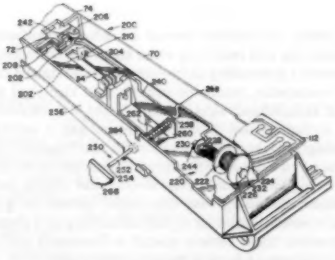


1. A drive mechanism for a disc player comprising: a chassis; a pair of guide rails spaced at a predetermined distance and fixed to said chassis parallel to each other; a plurality of bearings; a slider having both sides thereof contacting corresponding sides of said guide rails through said bearings; a retainer for restricting deviation of said bearings, said retainer having first means for restricting said bearings and second means for engaging said guide rails, said retainer engaging said slider through said bearings, said retainer being slidable in a longitudinal direction of said guide rails.

4,442,517
STYLUS PROTECTING MECHANISM FOR VIDEO DISC PLAYER

Eric A. Brauer, Danville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,315
Int. Cl.³ G11B *3/58*
U.S. Cl. 369—71 **5 Claims**



1. In a record player including a pickup stylus subject to engagement with a turntable-supported record during playback; said stylus being mounted at one end of a stylus arm having its other end yieldably supported in a translatable carriage which is subject to lateral motion between a rest position clear of said turntable and playback positions over said turntable; said player further having a selectively-activated means mounted in said carriage for lifting and lowering said stylus arm; said player additionally including a carriage-mounted stylus cleaning means for selectively cleaning said stylus; an apparatus comprising:

sensing means subject to conditioning in a first state and a second state in response to the disposition of said carriage away from said rest position and at said rest position respectively;

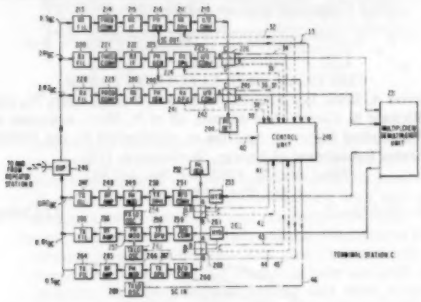
said sensing means, when disposed in said second state, disabling said carriage-mounted stylus cleaning means.

4,442,518

CHANNEL SWITCHING SYSTEM FOR USE IN A DIGITAL COMMUNICATION SYSTEM

Hideaki Morimoto, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,225
Claims priority, application Japan, Apr. 28, 1980, 55-57252
Int. Cl.³ H04L *1/22*
U.S. Cl. 371—8 **10 Claims**



1. A channel switching method for use in a digital communication system having a repeater station linking first and second stations with at least first and second regular channels and a standby channel, said first and second regular channels including a regenerative relay channel and a dropping/insertion channel at said repeater station, respectively, and each of said channels being capable of carrying a digital signal, said method comprising the steps of:

(1) detecting at said second station a channel fault condition on each of said first channel and said standby channel and providing a first control signal upon detections of a fault on said first regular channel and a non-fault on said standby channel;

(2) transmitting at said second station said first control signal from said second station to said first station through said repeater station;

(3) transmitting at said first station said digital signal over said first regular channel and said standby channel in response to said first control signal, providing a second control signal indicative of said transmitting, and transmitting said second control signal to said repeater station;

(4) transmitting at said repeater station a third control signal indicative of the presence or absence of a fault on said standby channel between said first station and said repeater station to said second station in response to at least said second control signal;

(5) providing at said repeater station a fourth control signal in response to at least said second control signal;

(6) connecting at said repeater station said standby channel between said first station and said repeater station to the standby channel between said repeater station and second station in response to said fourth control signal, and providing a fifth control signal indicative of said connecting;

(7) transmitting at said repeater station said fifth control signal to said second station; and

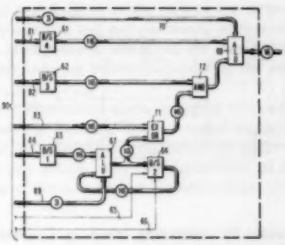
(8) switching over at said second station said first regular channel to said standby channel in response to at least said third and fifth control signals at said second station.

4,442,519

MEMORY ADDRESS SEQUENCE GENERATOR

Robert E. Jones, Fishkill, and Donald H. Wood, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1982, Ser. No. 354,971
Int. Cl.³ G11C *29/00*; G01R *31/28*
U.S. Cl. 371—27 **7 Claims**



1. In a device for testing the operation of a multi-dimensional data storage memory, an apparatus for producing a selected one of a plurality of sequences of numerical values manifestive of the successive memory elements to be tested comprising;

(a) a plurality of pairs of address generating means, each pair consisting of a first and a second address generating means, each of said first and said second address generating means being operative responsive to preset numerical values and the receipt of timing impulses to produce a sequence of numerical values manifestive of the respective addresses of the memory elements to be tested;

(b) selecting means connected to the outputs of said first and second address generating means of each of said pairs and operative responsive to predetermined timing impulses for selecting the outputs of said first or said second address generating means;

(1) each of said first and said second address generating means comprising;

i. counting means operative responsive to a succession of timing impulses and a preset differential value for producing a succession of numerical values each differing from the preceding one in the succession by the preset value;

ii. control means operative responsive to a preset control and connected to the output of said counting means for causing the output of said counting means to ascend or descend in value;

iii. masking means connected to the output of said control means and operative responsive to a preset value to inhibit the value of the numerical sequence from exceeding a value one less than the preset value;

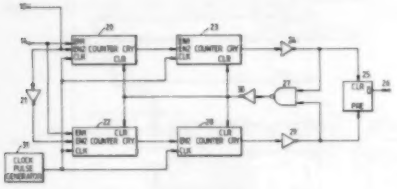
iiii. and means for adding a constant value to each of the sequence of numerical values of the sequence of numbers after the sequence is inhibited by said masking means,

whereby said first of said address generating means produces a first unique sequence of memory addresses and said second of said address generating means produces a second unique sequence of memory addresses and said selecting means selects the intermixing of the first and second sequences.

4,442,520
SIGNAL ERROR DETECTING

John G. S. Ive, and Alan C. Thirlwall, both c/o Sony Broadcast Limited, City Wall House, Basing View, Basingstoke, Hampshire, England

Filed Nov. 2, 1981, Ser. No. 317,295
Claims priority, application United Kingdom, Nov. 18, 1980, 8036934
Int. Cl.³ G06F *11/08*
U.S. Cl. 371—55 **14 Claims**



1. Apparatus for correcting errors in a square-wave input signal which alternates between first and second levels in periodic sequences, comprising:

first and second counter means supplied with said input signal and connected so that said first counter means is enabled to count when said input signal is of said first level and said second counter means is enabled to count when said input signal is of said second level;

a clock pulse source for supplying to said first and second counter means a clock pulse signal of high frequency relative to the frequency of said input signal;

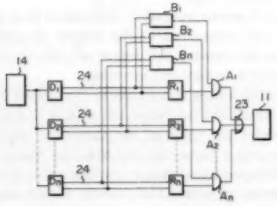
error detector means connected to said input signal for detecting errors therein and supplying an error signal to disable both said first and second counter means; and

a bistable circuit arranged to be triggered to a first stable condition by an overflow signal from said first counter means and to a second stable condition by an overflow signal from said second counter means, whereby said bistable circuit supplies an output signal forming a corrected replica of said input signal.

4,442,521
SWITCHING DEVICE FOR DETECTING INTERRUPTIONS IN TRANSMISSION LINES

Hajimu Inaba, and Hideo Miyashita, both of Hino, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,318
Claims priority, application Japan, Sep. 1, 1980, 55-119828
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—68 **2 Claims**



2. A switching system for a plurality of parallel transmission lines carrying a serial digital signal between an input circuit and an output circuit comprising:

a plurality of driving means connected to said input circuit, each of said driving means producing a first digital output corresponding to said digital signal and a second digital output of opposite plurality to said first digital output;

a receiver means connected to each of said driving means for receiving said first and second digital outputs and reconverting them to produce an output signal corresponding to said digital signal;

an exclusive OR gate connected to each of said driving means having inputs for receiving said first and second digital outputs and providing an output only when said first and second digital outputs of opposite polarity are received;

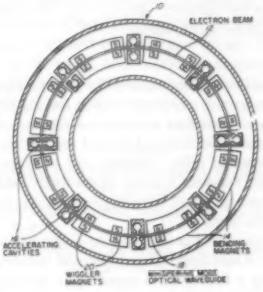
an AND gate having inputs connected to the output of said receiver means and exclusive OR gate of each driving means, said AND gate functioning as a switch to stop passage of said receiver output signal if no exclusive OR gate output is present; and

an OR gate having inputs connected to the outputs of each of said AND gates, for combining the output signals received from each receiver means.

4,442,522
CIRCULAR FREE-ELECTRON LASER

Charles A. Brau, Los Alamos; Norman A. Kurnit, Santa Fe, and Richard K. Cooper, Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 26, 1982, Ser. No. 342,682
Int. Cl.³ H01S *3/00*
U.S. Cl. 372—2 **12 Claims**



1. A high power, high efficiency free electron laser comprising:

circular relativistic electron beam accelerator means for producing a circular relativistic electron beam;

free electron laser wiggler means disposed in said circular relativistic electron beam accelerator for generating a periodic magnetic field to transform energy from said circular relativistic electron beam to optical energy;

circular whispering mode optical waveguide means for guiding said optical energy in a circular path in said circular relativistic electron beam accelerator such that said circular relativistic electron beam and said optical energy are spatially contiguous in a resonant condition for free electron laser operation.

4,442,523
HIGH POWER METAL VAPOR LASER

Bernard G. Bricks, Berwyn, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

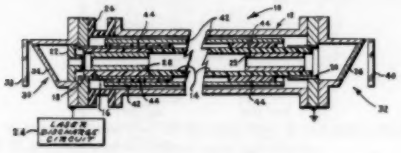
Filed Dec. 17, 1981, Ser. No. 331,750
Int. Cl.³ H01S *3/22*
U.S. Cl. 372—56 **3 Claims**

1. In a high power metal vapor laser having a housing; means situated adjacent each end of said housing for defining a

resonant cavity therebetween, said resonant cavity containing a lasing medium therein; means located adjacent one end of said housing for initiating a lasing action in said housing; a longitudinally extending, non-electrically conductive discharge tube within said housing; means made of an electrically conductive material adjacent the other end of said housing for supporting an end of said discharge tube; and a recirculating wick structure; the improvement therein comprising:

said recirculating wick structure being positioned at said one end of said housing adjacent said initiating means and being located adjacent to and outside of the confines of said discharge tube;

means made of an electrically conductive material adjacent said one end of said housing for supporting both another



end of said discharge tube and said wick structure, said supporting means for said discharge tube and said wick structure being of sufficient length so as to be positioned directly in line with and circumscribing both said wick structure and a portion of said discharge tube; and

means made of a non-electrically conductive material being directly interposed between said wick structure and said supporting means for said discharge tube and said wick structure for electrically separating said wick structure from said supporting means for said discharge tube and said wick structure;

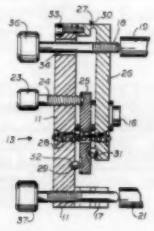
whereby said metal vapor laser produces a high output and substantially eliminates the problem of discharge tube breakge.

4,442,524

MULTIPLE LEVER APPARATUS FOR POSITIONING AN OPTICAL ELEMENT

Dennis J. Reeder, Cupertino, Calif.; John S. Campbell, Indianapolis, Ind.; Keith J. Kasunic, Los Altos Hills, and Lee H. Laiterman, Santa Clara, both of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Jun. 3, 1982, Ser. No. 384,459
Int. Cl.³ H01S 3/08
U.S. Cl. 372—107 **7 Claims**



1. An apparatus for making fine adjustments in the positioning of a mirror in a laser cavity and comprising,

a mirror base plate to which the mirror is attached,

a first fine-adjustment mechanism for making an angular adjustment of the base plate and mirror about one axis, said mechanism comprising,

an input link and an output link arranged generally parallel to one edge of the base plate with each link acting as a lever and first pivot means for imparting great mechanical advantage to motion at one end of the output link as a result of input motion of one end of the input link,

output link fulcrum means associated with fixed structure of the laser and located near the opposite end of the output link for establishing still greater mechanical advantage through the pivoting of the output link,

second pivot means connecting one end of the base plate edge to the output link at a point of reduced motion of the output link near said opposite end of the output link,

base plate fulcrum means associated with fixed structure of the laser and located at the end of the base plate edge opposite said one end and positioned so that said reduced motion of the output link pivots the base plate about the base plate fulcrum means for adjusting the mirror about one axis, and

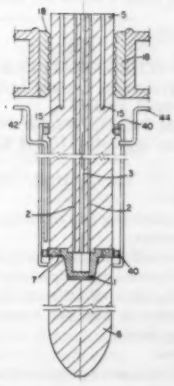
an input fine-adjustment screw engaging said one end of the input link and threaded through screw threads associated with the base plate so that rotation of the input fine-adjustment screw effects very fine adjustment of the angular position of the base plate and mirror about said one axis.

4,442,525

ELECTRODE FOR ARC FURNACES

Dieter H. Zölner, Claremorris, Ireland; Friedrich Rittmann, Rückersdorf b. Nünberg, Fed. Rep. of Germany; Herbert Dung, Dortmund, Fed. Rep. of Germany; Johannes Haremsa, Herne, Fed. Rep. of Germany; Georg Bauer, Witten-Bommern, Fed. Rep. of Germany; Josef Otto; Josef Mühlenbeck, both of Wetter, Fed. Rep. of Germany, and Inge Lauterbach-Dammler, Nuremberg, Fed. Rep. of Germany, assignors to Arc Technologies Systems Ltd., Cayman Island

Filed Jan. 26, 1982, Ser. No. 342,813
Int. Cl.³ H05B 7/08
U.S. Cl. 373—93 **30 Claims**



1. An arc furnace electrode comprising a metallic top portion having a lower region, a consumable replaceable bottom portion, a threadable interconnection joining said top portion and said bottom portion, a liquid cooling means for cooling said top portion including a feed and a return duct, and a protective covering provided over at least a portion of the top portion particularly including said bottom region, said protective covering being constituted by a sheath of electrically conductive, mechanically resistant material detachably surmounted upon the top portion.

4,442,526

ELECTRIC ARC FURNACE ARCING ELECTRODE SEAL

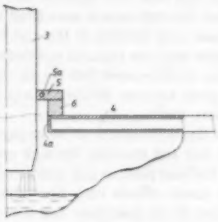
Bo Rappinger, and Sven-Einar Stenkvist, both of Västerås, Sweden, assignors to ASEA AB, Västerås, Sweden

Filed Apr. 19, 1982, Ser. No. 369,619

Claims priority, application Sweden, Apr. 21, 1981, 8102527

Int. Cl.³ H05B *7/12*

U.S. Cl. 373—95 **3 Claims**



1. An electric arc furnace having an electrically conductive roof forming an opening through which an arcing electrode depends, the opening having a periphery forming a space around the electrode so as to prevent arcing between the roof and electrode when the furnace is operating, an electrically non-conductive tubular column surrounding the electrode and extending upwardly from said periphery and forming an upwardly extending space around the electrode, and an electrically conductive seal positioned around the electrode on the upper end of the column and closing the upper end of the upwardly extending space, the seal being water cooled and providing a sliding contact between itself and the electrode so that it is in electrical contact with the electrode and the column spacing the seal from the roof so as to prevent arcing between the seal and the furnace roof when the furnace is operating, said column having an inside diameter not less than the diameter of said periphery so as to cause the latter and the adjacent portion of said roof to shield said inside from direct exposure to the inside of the furnace below the roof.

4,442,527

SYNCHRONIZATION SYSTEMS

Peter J. Munday, Reading, England, assignor to Racal Research Limited, Bracknell, England

Filed Dec. 18, 1981, Ser. No. 332,192

Claims priority, application United Kingdom, Jun. 24, 1981, 8119492

Int. Cl.³ H04L *7/00*

U.S. Cl. 375—1 **16 Claims**

1. A radio transmitting and receiving system, comprising

a radio transmitter,

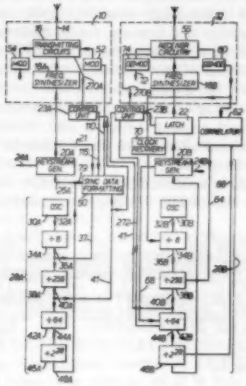
transmitter control means operative to control the transmitter so that it transmits successively at each one in a predetermined sequence of different transmitting frequencies each of which is held for a respective predetermined transmitting period,

a radio receiver,

receiver control means operative to control the receiver so that it receives successively at each of the frequencies in the said sequence, and

synchronisation means operative to synchronise the transmitter control means and the receiver control means by means of the provision of timing information which tends to make the receiver frequency at any time the same as the transmitter frequency,

the synchronisation means comprising formatting means at the transmitter for producing, and transmitting to the receiver during some, only, of the said predetermined transmitting periods, a synchronisation signal whose value represents part of the timing information and whose time of occurrence represents another part of the timing information, and sync receiving means at the receiver for



extracting the value of the synchronisation signal and its time of occurrence.

4,442,528

PULSE COMMUNICATION METHOD AND SYSTEM USING CMI TO 3-LEVEL CMI CONVERSION

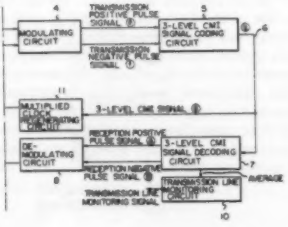
Akira Fukuda, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 14, 1982, Ser. No. 368,846

Claims priority, application Japan, Apr. 27, 1981, 56-64898; Mar. 5, 1982, 57-34983

Int. Cl.³ H03K *13/24*

U.S. Cl. 375—20 **11 Claims**



1. A pulse communication method comprising the steps of:

converting a data signal to be transmitted into a CMI code in synchronism with a clock signal;

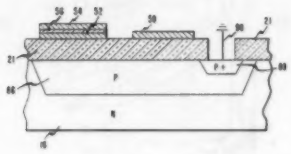
converting said CMI code into a 3-level CMI signal and thereafter transmitting it from the transmission side to the reception side through a transmission line; and

decoding the 3-level CMI signal into the CMI code and thereafter regenerating and extracting the data signal and the clock signal separately on the reception side.

4,442,529
POWER SUPPLY REJECTION CHARACTERISTICS OF CMOS CIRCUITS

Bhupendra K. Ahuja, Sunnyvale, Calif., and Mirmira R. Dwarakanath, Berkeley Heights, N.J., assignors to AT&T Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 4, 1981, Ser. No. 231,478
Int. Cl.³ H01L *27/04, 29/78;* **H04L** *3/00*
U.S. Cl. 375—34 **8 Claims**



1. In combination in a CMOS integrated circuit that includes both N-channel and P-channel type transistors,

multiple interconnected node points including some each characterized by a relatively high impedance,

and transistors of only one type directly connected to selected ones of said high impedance node points,

wherein said CMOS circuit is formed on a single integrated circuit chip,

wherein each of said transistors connected to said selected high-impedance node points comprises an N-channel transistor each of which comprises

a P-tub formed in an N-substrate, and N^+ source and drain regions formed in said P-tub,

and wherein said combination further includes a regulated power supply on said chip for maintaining the P-to-N^+ junctions of the N-channel transistors connected to said selected points reverse biased under all circuit operating conditions,

and means connecting the P-tubs of the N-channel transistors connected to said selected points to said regulated supply,

wherein the circuit on said chip includes conductive runners overlying said substrate and connected to high impedance node points,

and wherein said combination further includes P-tubs formed in said substrate under at least some portions of said conductive runners,

and means connecting said last-mentioned P-tubs to a point of reference potential,

said reference potential being different from the output of said regulated supply and more positive than the most negative supply on said chip.

4,442,530
DIGITAL TRANSMITTER WITH VECTOR COMPONENT ADDRESSING

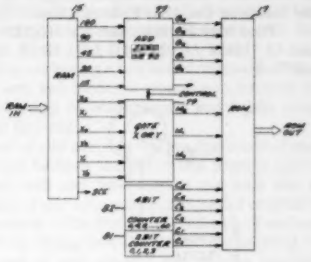
Henry H. Parrish, Jr., Miami Springs, and Rangarajan Srinivasagopalan, Miami, both of Fla., assignors to Racal Data Communications Inc., Miami, Fla.

Filed Sep. 21, 1981, Ser. No. 304,018
Int. Cl.³ H04L *27/20*
U.S. Cl. 375—67 **11 Claims**

1. A method of utilizing a first memory in a transmitter wherein said first memory stores values to be addressed and operated upon to construct a composite waveform for transmission by said transmitter comprising the steps of:

addressing said first memory with a first address including a first vector component subaddress and an angle subaddress to produce a first output from said first memory;

addressing said first memory with a second address including a second vector component subaddress and a modified subaddress formed as a mathematical function of said angle subaddress to produce a second output from said first memory; and

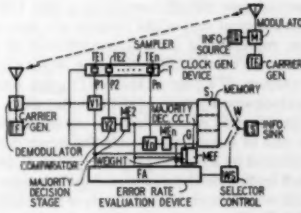


utilizing said first and second outputs in formation of said composite waveform.

4,442,531
METHOD AND APPARATUS FOR RECOGNIZING DIGITAL INFORMATION IN DIGITAL INFORMATION TRANSMISSION, PARTICULARLY IN MOBIL RADIO COMMUNICATIONS SYSTEMS

Probodh D. Gupta, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 27, 1981, Ser. No. 296,821
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036612
Int. Cl.³ H04L *1/22*
U.S. Cl. 375—94 **5 Claims**



1. A method for recognizing digital information of a digital information transmission, comprising the steps of:

first sampling, at a whole multiple of the information clock frequency, a pulse in a respective area of the pulse representing an information element in which the pulse assumes its suspected, quasi-stationary state;

then sampling the pulse of the information element at least one more time at a further multiple of the information clock frequency a corresponding number of sampling times within a further extended sampling range of the pulse representing the information element;

performing a majority decision with the sampling results to obtain respective information signals;

temporarily storing the information signals;

selecting one of the stored information signals as representing the information content of the sampled information element; and

erasing the non-selected stored information signals.

4,442,532

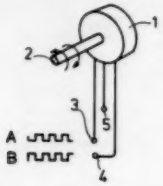
ENCODER OUTPUT PULSE DETECTION USING TWO STAGE SHIFT REGISTER AND CLOCK OSCILLATOR

Takehide Takemura, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 19, 1981, Ser. No. 265,323

Int. Cl.³ H03K *13/02;* **G01G** *3/00;* **G01R** *19/14*

U.S. Cl. 377—3 **2 Claims**



1. A pulse detection circuit for detecting output signals of an encoder, which comprises:

a first and a second input terminals, each for receiving either one of said encoder output signals containing two successions of pulses being shifted in phase with each other;

a first and a second rise-up detectors for detecting the rise-up edges of the pulses being fed to said first and second input terminals;

a first and a second fall-down detectors for detecting the fall-down edges of said pulses;

a first gate circuit composed of AND gates, each for obtaining a logical product of the output of either one of said first rise-up and fall-down detectors and the signal level at said second input terminal, or for obtaining a logical product of the output of either one of said second rise-up and fall-down detectors and the signal level at said first input terminal; and

a second gate circuit composed of OR gates each for obtaining a logical sum of the logical products obtained by said AND gates in said first gate circuit,

said second gate circuit comprising a first OR gate which issues a logical sum of the outputs of a part of said AND gates, representing a clockwise rotation of the encoder shaft, and a second OR gate which issues a logical sum of the outputs of a part of the AND gates representing an anti-clockwise rotation of the encoder shaft, and

each combination of said first rise-up and fall-down detectors, and of second rise-up and fall-down detectors being constituted by a two stage shift-register, a clock oscillator which feeds a clock pulse to said shift-register, a third gate circuit which receives the outputs of said shift-register and an RS-flip-flop, output terminals of said third gate circuit being connected to said RS-flip-flop which is adjusted to be reset by said clock pulse.

4,442,533

IMAGE PLANE INDICATOR

Charles Lescrenier, 660 Crescent Ct., Wauwatosa, Wis. 53213

Filed Aug. 20, 1981, Ser. No. 294,706

Int. Cl.³ G03B *41/16*

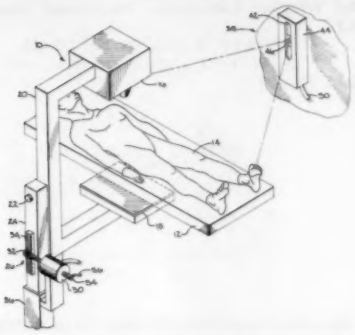
U.S. Cl. 378—21 **6 Claims**

1. In an X-ray device in which the X-ray generator and image receptor are movable about a fulcrum that defines the plane of the image appearing on the receptor, the fulcrum being movable relative to an object being imaged and normal to the image plane to establish the location of the image plane in the object, an image plane indicator comprising:

indicating means movable with respect to the object normal to the plane of the image for providing a visually perceptible indication on the object of the image plane location;

detection means operably connected to the movable fulcrum, said detection means generating a signal responsive to movement of the fulcrum; and

positioning means operably connected to said detection means and to said indicating means, said positioning means



moving said indicating means in response to said signal generated by said detection means for maintaining the visually perceptible indication at the image plane location as the fulcrum is moved.

4,442,534

X-RAY DIAGNOSTIC INSTALLATION FOR X-RAY TOMOGRAPHIC IMAGES

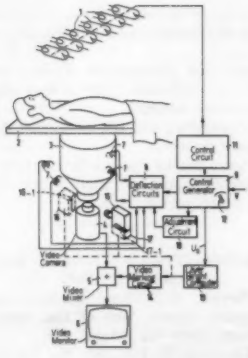
Joerg Haendle, and Hartmut Sklebitz, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,757

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128380

Int. Cl.³ A61B *6/00;* **H04N** *5/32;* **H05G** *1/64, 1/70*

U.S. Cl. 378—21 **10 Claims**



1. An x-ray diagnostic installation for x-ray tomographic images, comprising x-ray source means **(1)** for the generation of an x-ray beam, a patient support **(2)**, an image detector **(3)** and a control generator **(9)**, connected with the x-ray source means **(1)** and the image detector **(3)**, for the purpose of movement of the x-ray beam and, synchronously thereto, of the image field of the image detector **(3)**, characterized in that a layer height computer **(13)** is connected to the control generator **(9)** for calculating the enlargement from the geometric data for the tomogram, and that the image detector **(3)** has circuit means **(14, 16)** connected with the layer height computer **(13)**

for fading-in a marking for representing the dimensions in the layer plane.

4,442,535

FLUORESCENT X-RAY FILM THICKNESS GAUGE FOR VERY SMALL AREAS

Hiroshi Ishijima, and Toshiyuki Koga, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 360,909

Claims priority, application Japan, Apr. 7, 1981, 56-49995

Int. Cl.³ G01B *15/02*

U.S. Cl. 378—50 **10 Claims**

2. In a fluorescent X-ray film thickness gauge having means for irradiating a film-coated sample with X-rays: detector means spaced from the sample for detecting fluorescent X-rays emitted by the sample and producing an output signal representative of the film thickness, said detector means having a longitudinal axis and being angularly displaceable about its longitudinal axis and having a detector opening for receiving therethrough the fluorescent X-rays emitted by the sample; and means for angularly displacing the detector means about its longitudinal axis to accordingly adjust the position of the detector opening relative to the sample so as to effectively minimize variations in the intensity of the detected fluorescent X-rays due to variations in the distance of the sample from the detecting means.

4,442,536

X-RAY EXAMINATION APPARATUS

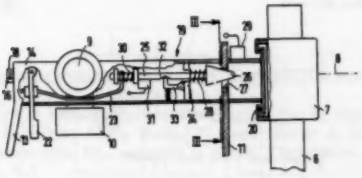
Willi Schaefer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 16, 1981, Ser. No. 284,101

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1980, 3030379

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—26 **18 Claims**



1. An x-ray examination apparatus comprising a patient support platform, a tube stand displaceable parallel to the longitudinal axis of the horizontally positioned patient support platform, a tube support arm mounted by the tube stand, an x-ray tube support-mounted on the tube support arm on one side of the patient support platform, and a radiographic installation having an image recording means displaceable along the patient support platform at an opposite side of the patient support platform, said radiographic installation having a coupling rod capable of being coupled with the tube support arm for aligning the x-ray tube relative to the image recording means, characterized in the coupling rod being longitudinally displaceable at the image recording means and being longitudinally shiftable relative to the tube support arm and having surfaces longitudinally movable with the coupling rod so as to be moved into positive locking engagement with the tube support arm,

said coupling rod having a first end connected with said tube support arm and having a second end coupled directly with said image recording means and rigidly connected with said first end,

said first end of said coupling rod in a first mode of operation having said surfaces thereof in said positive locking engagement with said tube support arm such that pivotal movement of said tube support arm causes conjoint swinging movement of the first and second ends of said coupling rod without change in the length of said coupling rod, the second end of said coupling rod moving longitudinally relative to the image recording means as the image recording means moves along the patient support platform, and

said coupling rod being shiftable as a unit in the longitudinal direction thereof to move said surfaces out of positive locking engagement with the tube support arm to allow pivotal movement of the tube support arm in a second mode of operation without requiring a corresponding swinging movement of said coupling rod and without requiring complete disconnection of the first end of the coupling rod from the tube support arm.

4,442,537

DIAGNOSTIC X-RAY INSTALLATION

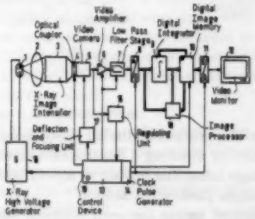
Joerg Haendle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 12, 1982, Ser. No. 377,465

Claims priority, application Fed. Rep. of Germany, May 18, 1981, 3119751

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—99 **16 Claims**



12. A method of operating a diagnostic x-ray installation to selectively increase the signal to noise ratio of the video signal supplied by an x-ray image intensifier television chain while minimizing the x-ray exposure of a patient, wherein the installation includes an x-ray high voltage generator and an x-ray tube for energization by the high voltage generator to produce an x-ray beam for use in the examination of a patient, the x-ray image intensifier television chain including an x-ray image intensifier responsive to an input x-ray image for producing a light image in according with the input x-ray image, and a video camera coupled with the x-ray image intensifier for scanning of the light image therefrom to produce a video signal, said method comprising: operating said x-ray tube with a x-ray tube high voltage for normal fluoroscopy operation and regulating the intensity of the high voltage and current of the X-ray tube to maintain a first relatively constant average illumination of the video camera, and operating said video camera at a first scanning rate so as to supply a video signal having a normal television line rate; and selectively, in order to obtain

an image with higher signal to noise ratio, switching over the high voltage generator to pulse operation, and regulating the intensity of the high voltage and current of the X-ray tube to maintain a second relatively constant average illumination of the video camera which is substantially higher than said first relatively constant average illumination, but operating the high voltage generator with a pulse duration and a pulse period such that the average dose rate for the patient is not substantially increased, and operating said video camera with a second scanning rate which is substantially lower than said first scanning rate so as to supply a video signal having a reduced video line rate and having a correspondingly reduced essential bandwidth, whereby an improved signal to noise ratio can be insured.

4,442,538

X-RAY DIAGNOSTIC INSTALLATION

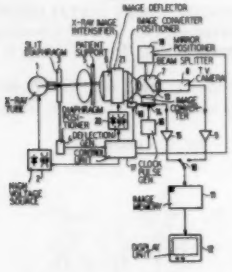
Joerg Haendle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,283

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141987

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—146 **10 Claims**



1. An X-ray diagnostic installation comprising:

an X-ray tube for emitting a fan-shaped radiation beam;

an X-ray image intensifier having an input fluorescent screen and an output fluorescent screen;

a patient support means disposed between said X-ray tube and said X-ray image intensifier;

a means disposed in front of said X-ray tube for generating movement of said radiation beam for sweeping said beam over a subject on said support device;

an image recording means connected to the output of said image intensifier, said image recording means having a solid state image converter optically coupled to said output fluorescent screen of said image intensifier, said solid state image converter having a recording region;

a control means connected to at least one of said means for generating movement of said radiation beam, said image intensifier or said image converter for controlling transmission of the image from said image intensifier to said image converter such that a linear image on said output fluorescent screen of said image intensifier during movement of said radiation beam is always directed at said recording region of said image converter; and

a display unit connected to said image recording device for visually displaying a reproduction of the output of said image intensifier.

4,442,539

MEASURING INSTRUMENT FOR THE OPTICAL FOCAL SPOT

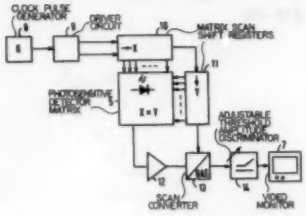
Horst Aichinger, Fuerth, and Kurt Franke, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 1, 1981, Ser. No. 268,811

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022968

Int. Cl.³ H05G *1/26*

U.S. Cl. 378—207 **2 Claims**



1. A measuring instrument for measuring the optical focal spot of an x-ray tube, comprising a pinhole camera for the purpose of forming an image of the focal spot, and a radiation-sensitive detector, said detector comprising a radiation-electrical transducer in the form of a matrix of photo-sensitive individual detectors for supplying respective output signals, a processing circuit comprising output means connected with the photo-sensitive individual detectors of said matrix for reading out the output signals of said detectors to generate a video signal in accordance with a visible light image incident on said matrix, and a video monitor connected with said output means for displaying the focal spot as represented by said video signal, said processing circuit including an adjustable amplitude selector means for selecting a desired amplitude range of said output signals for transmission to said video monitor via said output means, and an intensifier foil arranged in front of said matrix of photo-sensitive individual detectors for the conversion of an x-ray image of the focal spot into a visible light image incident on said matrix.

4,442,540

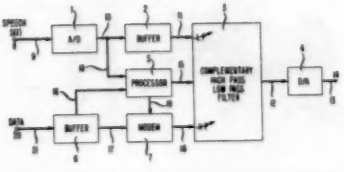
DATA OVER VOICE TRANSMISSION ARRANGEMENT

Jonathan B. Allen, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 4, 1981, Ser. No. 270,543

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—31 **6 Claims**



1. A method for interpolating data and speech signals into a common transmission band comprising the steps of:

(a) converting the speech signal from analog to digital form,

(b) determining a frequency spectrum of the digital speech signal,

(c) determining a total energy content of the digital speech signal,

(d) determining the actual percentage of the total energy within each spectral line,

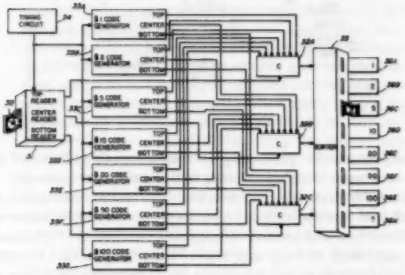
(e) summing the actual percentages of energy within a number of spectral lines,
(f) comparing the summed actual percentages of energy to the total energy content of the speech signal until a predetermined percentage is reached,
(g) determining the cutoff frequency of the digital speech signal when the predetermined percentage is reached,
(h) modulating the data signal to a position above the cutoff frequency of the speech signal, and
(i) sending the speech and modulated data signal to a receiver.

4,442,541

METHODS OF AND APPARATUS FOR SENSING THE DENOMINATION OF PAPER CURRENCY

Joel R. Finkel, Wayland; William E. Freudenthal, Marlborough, both of Mass., and John G. Stoides, Culpeper, Va., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 15, 1979, Ser. No. 67,064
Int. Cl.³ G06K 7/08; B07C 5/00
U.S. Cl. 382—7 **2 Claims**



1. A method for sensing the denomination of U.S. Federal Reserve Notes comprising
magnetically scanning at least three parallel predetermined paths along an obverse surface of a Note to be denomination sensed;
comparing the results of said scanning against a like plurality of standards for each of the various denominations: one, two, five, ten twenty, fifty, and one hundred dollars;
determining whether the scanned Note is of said one dollar denomination, said two dollar denomination, said five dollar denomination, said ten dollar denomination, said twenty dollar denomination, said fifty dollar denomination, said one hundred dollar denomination or is questionable; and
sorting said scanned Note in accordance with such determination.

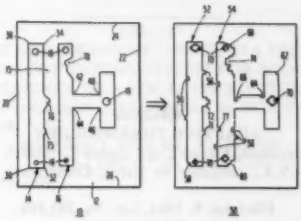
4,442,542

PREPROCESSING CIRCUITRY APPARATUS FOR DIGITAL DATA

Ta-Tung Lin, deceased, late of Harleysville, Pa.; by Meei H. Lin, Executrix, North Wales, Pa., and George A. Fedde, Perkiomenville, Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 29, 1982, Ser. No. 344,245
Int. Cl.³ G06K 9/46
U.S. Cl. 382—8 **5 Claims**

1. A preprocessing circuit for recognizing a plurality of different conductor/substrate corner features present in a plurality of lines of binary signals representing a conductor pattern present on a printed circuit board, said lines of binary signals generated by a scanning apparatus which scans said printed circuit board in a plurality of row scans, there being a plurality of scan clock pulses during each of said row scans, said plurality of scan clock pulses being associated with said binary signals in each of said plurality of lines of binary signals, said binary signals also containing various errors, said errors comprising horizontally or vertically adjacent corner feature pairs, said preprocessing circuit comprising:
arraying means for providing a corner array of output signals formed from said binary signals in portions of a plurality of adjacent row scans, said arraying means providing a separate corner array of output signals associated with each of said plurality of scan clock pulses;
corner code generating means connected to said arraying means for receiving a plurality of selected ones of each of said corner array of output signals and for generating corner code signals associated with said corner features when said plurality of selected ones of each of said corner array of output signals indicates the presence of one of said corner features therein and for transmitting said corner code signals in response to an enable signal;
excess corner feature elimination means connected to said arraying means and to said corner code generating means for disabling transmission of said corner code signals when any of said horizontally adjacent or vertically adjacent corner feature pair includes said corner feature indicated



by said selected ones of said corner array whereby at least one excess corner feature is eliminated;
a plurality of row delay means each storing a row scan of binary signals and each providing at an output terminal a row shifted output signal whereby said plurality of delay means provides a plurality of row shifted output signals from a plurality of adjacent row scans;
a plurality of column delay means coupled to each of said output terminals of said row delay means for providing a plurality of column shifted output signals associated with each of said row scans;
said arraying means comprises:
serial/parallel register means for converting said lines of binary signals into lines of byte wide binary signals;
said row delay means comprises:
memory means for storing substantially a row scan of byte wide binary signals; and
parallel/serial register means connected to the output terminals of said memory means, said parallel/serial register means for converting said lines of byte wide binary signals to lines of sequential binary signals.

4,442,543

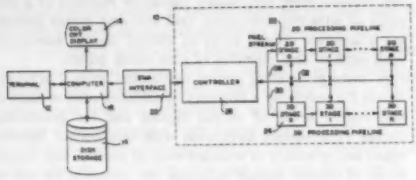
BIT ENABLE CIRCUITRY FOR AN IMAGE ANALYZER SYSTEM

Stanley R. Sternberg, and Robert M. Lougheed, both of Ann Arbor, Mich., assignors to Environmental Research Institute, Ann Arbor, Mich.

Continuation of Ser. No. 73,817, Sep. 10, 1979, Pat. No. 4,301,443. This application Aug. 12, 1981, Ser. No. 292,062
The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.
Int. Cl.³ G06K 9/36
U.S. Cl. 382—49 **2 Claims**

1. In a system for analyzing images made up of a matrix of points, with each point being represented by a multibit digital data signal, said system including at least one transformation

stage for transforming said data signals into a new value depending upon the values of neighboring points in the image, the improvement comprising:



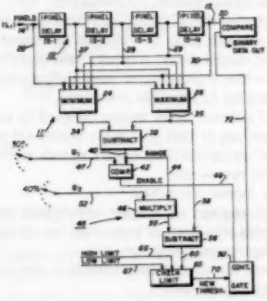
means for selectively disabling the transformation of particular bits in the digital signals for a given stage such that said particular bits pass unmodified in value to an output of the stage.

4,442,544

ADAPTIVE THRESHOLDER

John F. Moreland, Fairport, and James C. Stoffel, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 9, 1981, Ser. No. 281,816
Int. Cl.³ G06K 9/00
U.S. Cl. 382—53 **5 Claims**



5. Apparatus for adaptively thresholding image pixels, comprising, in combination:

(a) buffer means for storing a plurality of successive ones of said pixels including the pixel to be thresholded;

(b) means for identifying the maximum pixel in said plurality of pixels;

(c) means for identifying the minimum pixel in said plurality of pixels;

(d) first subtractor means for subtracting the output of said maximum pixel identifying means from said minimum pixel identifying means;

(e) multiplier means for multiplying the output of said first subtractor means by a predetermined constant representing a desired change in threshold level; and

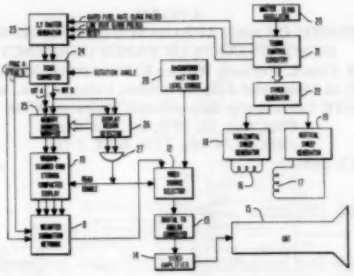
(f) second subtractor means for subtracting the output of said multiplier means from said maximum pixel identifying means to provide a threshold for use in thresholding said one pixel.

4,442,545

COMPACTION OF TELEVISION DISPLAY GRAPHICS IN PHANTOM-RASTER-SCANNED IMAGE MEMORY

Glenn A. Reitmeier, Trenton, N.J., and Christopher H. Strolle, Philadelphia, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,174
Claims priority, application United Kingdom, May 27, 1981, 8116111
Int. Cl.³ G06K 9/00
U.S. Cl. 382—56 **6 Claims**



1. Apparatus for generating a video signal descriptive of an area in a raster-scanned display, said apparatus comprising:

means for recurrently generating first and second series of digital electric signals respectively specifying in numeric form first and second orthogonal coordinates of phantom raster scan through said display area, there being a number m of signals in said first series and a number n of signals in said second series, where m and n may be equal or unequal integers;

a display memory having a plurality of storage locations each accessable in response to a unique pair of column and row addresses for read-out of a video sample concerning a point in one of selected regions of said display area for which graphic information is stored in the display memory in compacted form, there being a number p of column addresses and a number q of row addresses, where p and q may be equal or unequal integers, where p is no larger than m and q is no larger than n, and where one of the numbers p and q is smaller than the number it is specified as being no larger than;

means responsive to digital electric signals in said first series for generating purely in spatial coordinate terms corresponding column addresses for p selected ones of those digital electric signals;

means responsive to digital electric signals in said second series for generating purely in spatial coordinate terms corresponding row addresses for q selected ones of those digital electric signals;

means responsive to digital electric signals other than the p selected ones of said first series and q selected ones of said second series for supplying a source of video samples alternate to that provided by read-out of said display memory responsive to its being simultaneously addressed by column address generated responsive to a corresponding one of said p selected digital electronic signals of said first series and by column address generated responsive to a corresponding one of said q selected digital electric signals of said second series; and

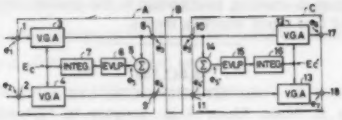
means responding to video samples read-out from said display memory in response to its said being simultaneously addressed, and to video samples supplied by said alternate source to provide said video signal.

4,442,546

NOISE REDUCTION BY INTEGRATING FREQUENCY-SPLIT SIGNALS WITH DIFFERENT TIME CONSTANTS

Yukinobu Ishigaki, Machida, Japan, assignor to Victor Company of Japan, Limited, Kanagawa, Japan

Filed Oct. 18, 1982, Ser. No. 434,850
Claims priority, application Japan, Oct. 19, 1981, 56-166603
Int. Cl.³ H04B *1/64*
U.S. Cl. 455—72 **6 Claims**



5. A noise reduction system having a pair of first and second audio channels between first and second ends, comprising:

a compression circuit at said first end including: first and second variable gain amplifiers connected in said first and second channels respectively for amplifying first and second audio signals each having frequency components in the audio spectrum at a variable gain in response to a first common control signal applied thereto and generating first and second gain-controlled audio output signals;

first frequency splitting means connected to be responsive to said first audio channel for splitting the output signal of said first variable gain amplifier into high and low frequency components and generating therefrom a first set of high and low frequency signals, and second frequency splitting means connected to be responsive to said second audio channel for splitting the output signal of said second variable gain amplifier into high and low frequency components and generating therefrom a second set of high and low frequency signals;

a first pair of envelope detecting means connected to be responsive to the outputs of said first frequency splitting means respectively for detecting the envelopes of said high and low frequency signals of said first set, and a second pair of envelope detecting means connected to be responsive to the outputs of said second frequency splitting means for detecting the envelopes of said high and low frequency signals of said second set;

first combining means for combining the detected envelopes of the high frequency signals of said first and second sets and generating a first combined high frequency output, and second combining means for combining the detected envelopes of the low frequency signals of said first and second sets and generating a first combined low frequency output;

first integrator means for integrating said combined high frequency output with a first time constant, and second integrator means for integrating said combined low frequency output with a second time constant greater than the first time constant; and

means for combining the output signals of said first and second integrator means to generate said first control signal; and

an expansion circuit at said second end including:

third and fourth variable gain amplifiers connected in said first and second channels respectively for amplifying said gain-controlled first and second audio output signals at a variable gain in response to a second common control signal applied thereto and generating a pair of output signals for application to a utilization means;

third frequency splitting means connected to be responsive to said first channel for splitting said first audio output signal into high and low frequency components and generating therefrom a fourth set of high and low frequency signals;

a third pair of envelope detecting means connected to be responsive to the outputs of said third frequency splitting means respectively for detecting the envelope of said high and low frequency signals of said third set, and a fourth pair of envelope detecting means connected to be responsive to the outputs of said fourth frequency splitting means respectively for detecting the envelope of said high and low frequency signals of said fourth set;

third combining means for combining the detected envelopes of the high frequency signals of said third and fourth sets and generating therefrom a second combined high frequency output, and fourth combining means for combining the detected envelopes of the low frequency signals of said third and fourth sets and generating therefrom a second combined and low frequency output;

third integrator means for integrating said second combined high frequency output with a smaller time constant, and fourth integrator means for integrating said second combined low frequency output with a greater time constant; and

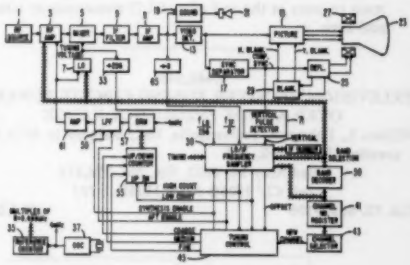
means for combining the output signals of said third and fourth integrator means to generate said second control signal.

4,442,547

COUNTER ARRANGEMENT USEFUL IN A FREQUENCY LOCKED LOOP TUNING SYSTEM FOR MEASURING THE FREQUENCY OF A LOCAL OSCILLATOR SIGNAL

Juri Tults, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 1, 1982, Ser. No. 413,768
Int. Cl.³ H04B *1/16*; H04N *5/44*
U.S. Cl. 455—180 **6 Claims**



1. In a television receiver including an RF input for receiving a plurality of RF signals corresponding to respective channels in frequency bands within the television range, each of said RF signals having a picture carrier; a RF stage for selecting one of said RF signals corresponding to a selected channel in response to a tuning control signal; a local oscillator for generating a local oscillator (LO) signal having a frequency corresponding to said selected channel in response to said tuning control signal; a mixer for combining said selected RF signal and said LO signal to produce an IF signal having a picture carrier corresponding to that of said selected RF signal; tuning control apparatus for generating said tuning control signal comprising:

a main down counter having a clock input;

coupling means for coupling said LO signal to said clock input of said main counter;

said main down counter counting in response to said LO signal when enabled to do so during an LO measurement interval;

main counter presetting means coupled to said main down counter means for selectively presetting said main counter to one of a first initial count corresponding to the channel number of the selected channel or a second initial count

corresponding to the particular frequency band of the selected channel prior to said LO measurement interval;

said main counter presetting means presetting said main down counter to said one of said first and second initial counts whenever said main down counter having a clock input has counted to zero;

an auxiliary down counter;

auxiliary down counter presetting means for presetting said auxiliary counter to an initial count equal to (P)(S)+(P), where P is an integer number and S is the frequency spacing, in mHz, between said channels

within said frequency bands, prior to auxiliary down counter control means coupled to said clock input of said auxiliary down counter and responsive to the count of the main down counter and said auxiliary down counter for causing said LO measurement interval;

said auxiliary down counter to count whenever said main down counter has counted to zero during said LO measurement interval and to be stopped from counting when said auxiliary down counter has counted to one during said LO measurement interval;

said main presetting means presetting said main down counter to the other one of said first and second initial counts when said auxiliary counter means has counted to P if said main down counter is preset to said first initial count and to (P)(S) if said main down counter is preset to said second initial count during said LO measurement interval;

count evaluating means coupled to said main down counter for evaluating the relationship between the count of said main counter at the end of said measurement interval and zero; and

tuning control signal generating means coupled to said count evaluating means for generating said tuning control signal in response to said relationship between the count of said main counter at the end of said LO measurement interval and zero.

4,442,548

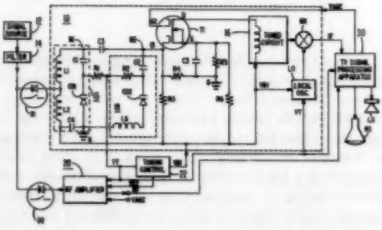
TELEVISION RECEIVER TUNING CIRCUIT TUNABLE OVER A WIDE FREQUENCY RANGE

William L. Lehmann, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 14, 1982, Ser. No. 378,115

Int. Cl.³ H04B *1/16*; H03F *3/191*

U.S. Cl. 455—195 **11 Claims**



1. In a receiver, apparatus comprising:

a signal source of radio frequency carrier signals in a frequency band;

a signal path between an input terminal for receiving said carrier signals and an output terminal including amplifying means for amplifying said carrier signals;

a control source for supplying a tuning signal having different magnitudes corresponding to respective radio frequency carrier signals;

first signal selecting means coupled to said signal path at a point between said input terminal and said amplifying means and having a peaked response which is tunable in response to said tuning signal for selecting ones of said carrier signals included within a portion of said frequency band;

second signal selecting means coupled to said signal path at a point between said input terminal and said amplifying means for exhibiting a peaked response at a resonant frequency no greater than the lowest frequency of any of said selected ones of said carrier signals, said second signal selecting means including

means tunable in response to said tuning signal for varying the resonant frequency of said second signal selecting means in tracking relationship to the peaked response of said first signal selecting means.

4,442,549

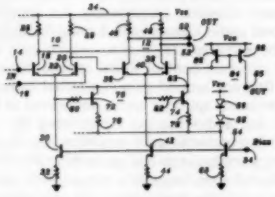
METER DRIVE CIRCUIT

William E. Main, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 27, 1982, Ser. No. 382,753

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—211 **10 Claims**



1. A method for producing an output signal the magnitude of which varies linearly with the logarithm of an input signal that is supplied to the input of a plurality of cascaded differential amplifier stages, each stage having a differential amplifier common node associated therewith, comprising the steps of:

producing a D.C. voltage change at said common node of each of said amplifier stages in response to variations in the magnitude of the input signal;

detecting said D.C. voltage change at the common node of each of said amplifier stages to provide corresponding current changes;

accumulating said current changes; and

supplying said accumulated current changes at an output.

4,442,550

DEVICE FOR RECOGNIZING A BINARY WORD

Ulrich Killat, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 296,655

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034640

Int. Cl.³ H04B *9/00*

U.S. Cl. 455—608 **10 Claims**

1. A device for recognizing a predetermined pulse pattern from a pulse stream, said pulse pattern having a predetermined number of pulses and absences of pulses, said device comprising:

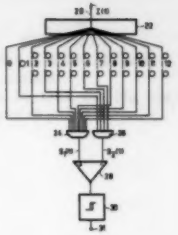
a number of delay elements equal to the number of pulses plus the number of absences of pulses in the predetermined pulse pattern, each delay element being associated with a pulse or absence of a pulse from the pulse pattern to be recognized, the relative time delay of each delay element being equal to the time between the pulse or absence of pulse associated with the delay element and the last pulse or absence of a pulse in the pulse pattern, each of said delay elements having an input and an output;

a conductor for transporting the pulse stream to the input of each delay element;

a first adder having inputs and an output, the output of each delay line associated with a pulse from the pulse pattern to be recognized being connected to an input of the first adder;

a second adder having inputs and an output, the output of each delay line associated with an absence of a pulse from the pulse pattern to be recognized being connected to an input of the second adder; and

a differential amplifier having inputs and an output, the output of the first adder being connected to one input of the differential amplifier and the output of the second adder being connected to another input of the differential amplifier, the output of the differential amplifier representing the difference between the outputs of the first and second adders.



273,339

COMBINED HELMET AND ORNAMENTATION THEREFOR

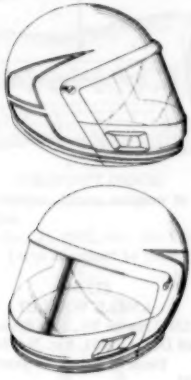
Klaus V. Gevert, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 243,786

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1980, MR 12260

Term of patent 14 years

U.S. Cl. D2—232



273,340

CUSHION PLUG FOR ATHLETIC SHOE COLLAR

Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.

Filed Apr. 9, 1982, Ser. No. 366,854

Term of patent 14 years

U.S. Cl. D2—310

273,341

FUR PIECE

Gabriel Rol, St-Lambert, Canada, assignor to Gabriel Francis Rol Inc., Montreal, Canada

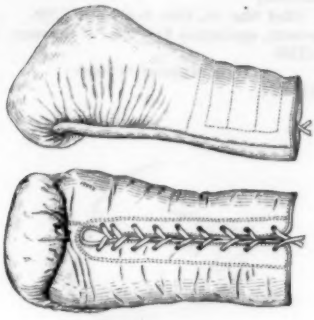
Filed Dec. 24, 1981, Ser. No. 334,309

Term of patent 14 years

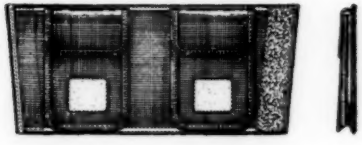
U.S. Cl. D2—344

273,342
FUR PIECE
Gabriel Roi, St-Lambert, Canada, assignor to Gabriel Francis Roi Inc., Montreal, Canada
Filed Dec. 24, 1981, Ser. No. 334,310
Term of patent 14 years
U.S. Cl. D2—344

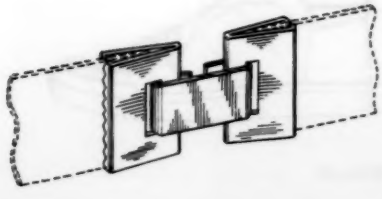
273,343
BOXING GLOVE
Howard Albert, 625 Main St., Apt. 1432, Roosevelt Island, N.Y. 10044
Filed Nov. 12, 1981, Ser. No. 320,759
Term of patent 14 years
U.S. Cl. D2—361



273,344
ANKLE WALLET
Yoong N. Lee, 2235 Trenton Dr., San Bruno, Calif. 94066
Filed Dec. 4, 1981, Ser. No. 327,329
Term of patent 14 years
U.S. Cl. D2—383



273,345
BELT BUCKLE
Edward D. Degenshein, New York, N.Y., assignor to Accessories by Pearl, New York, N.Y.
Filed Jul. 22, 1983, Ser. No. 517,207
Term of patent 14 years
U.S. Cl. D2—414



273,346
LAWN UMBRELLA
Edward Secon, Trumbull, Conn., assignor to The Sherwood Corporation, Spring City, Tenn.
Filed May 22, 1981, Ser. No. 266,495
Term of patent 14 years
U.S. Cl. D3—5

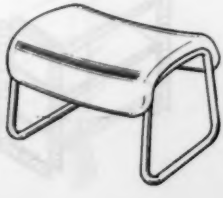
273,347
CROCHET HOOK
Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan
Filed Jan. 26, 1981, Ser. No. 228,203
Term of patent 14 years
U.S. Cl. D3—28

273,348
SKI AND SKI POLE CARRIER
Richard S. Risch, 1719 Labrador Dr., Costa Mesa, Calif. 92626, and Wayne Callaway, #6 Compass Ct., Long Beach, Calif. 90803
Filed Mar. 8, 1982, Ser. No. 355,692
Term of patent 14 years
U.S. Cl. D3—36

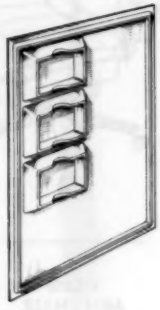
273,349
ARM CHAIR
Vincent Cafiero, Irvington, N.Y., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Nov. 12, 1981, Ser. No. 320,809
Term of patent 14 years
U.S. Cl. D6—31

273,350
ARM CHAIR
Vincent Cafiero, Irvington, N.Y., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Nov. 12, 1981, Ser. No. 320,811
Term of patent 14 years
U.S. Cl. D6—31

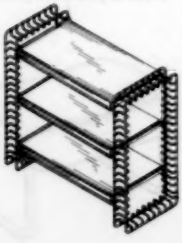
273,351
OTTOMAN
Arthur C. Crockett, Cincinnati, Ohio, assignor to Simmons Universal Corporation, New York, N.Y.
Filed Oct. 14, 1981, Ser. No. 311,693
Term of patent 14 years
U.S. Cl. D6—36



273,352
WALL MOUNTED HOLDER FOR THE EXPOSURE OF VARIOUS KINDS OF BANDAGING MATERIALS
Roger Adolfsson, Stockholm, Sweden, assignor to Cederroths AB, Sweden
Filed Mar. 5, 1981, Ser. No. 240,781
Term of patent 14 years
U.S. Cl. D6—130

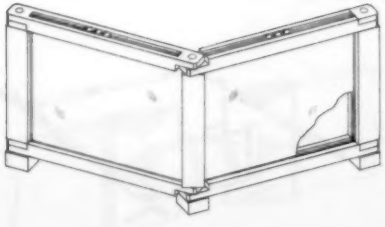


273,353
SHELF UNIT
Edward Secon, Trumbull, Conn., assignor to The Sherwood Corporation, Spring City, Tenn.
Filed Oct. 9, 1981, Ser. No. 309,987
Term of patent 14 years
U.S. Cl. D6—186

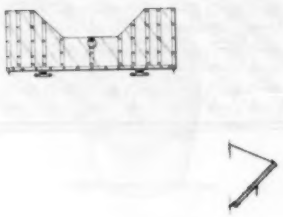


273,354
CHAIR OR SEAT END FRAME COMPONENT
Lewis F. Fitts, Tuscaloosa, Ala., assignor to Fitts Industries, Inc., Tuscaloosa, Ala.
Filed Jan. 19, 1982, Ser. No. 341,083
Term of patent 14 years
U.S. Cl. D6—192

273,355
MODULAR PICTURE FRAME
Robert E. Grind, 512 Fairviw Ct., Placerville, Calif. 95667
Filed Feb. 16, 1979, Ser. No. 12,881
Term of patent 14 years
U.S. Cl. D6—235



273,356
KNIFE HOLDER
Murry J. Miller, P.O. Box 3781, Springfield, Ill. 62708
Filed Feb. 22, 1982, Ser. No. 351,134
Term of patent 14 years
U.S. Cl. D7—74



273,357
FOOD DISPENSER
Radivoj Alfirevic, 111 Industrial Dr., Whitby, Ontario, Canada
Filed Sep. 28, 1981, Ser. No. 306,311
Term of patent 14 years
U.S. Cl. D7—306

273,358
HOT AIR CORN POPPER
Marshall B. Johnson, and Robert S. Myerly, both of Chillicothe, Ohio, assignors to Wear-Ever Aluminum, Inc., Chillicothe, Ohio
Filed Mar. 9, 1981, Ser. No. 241,624
Term of patent 14 years
U.S. Cl. D7—325

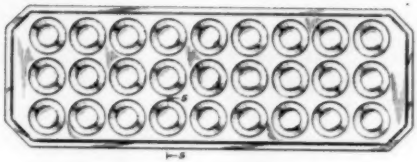
273,359
AXE HANDLE
Robert A. Kolonia, 81 Stockton St., Phillipsburg, N.J. 08865
Filed Aug. 12, 1981, Ser. No. 292,120
Term of patent 14 years
U.S. Cl. D8—80

273,360
COMBINATION KNIFESTEEL AND HOOK DESIGN
Ronald J. Hill, 3213 Willow Bend, Bedford, Tex. 76021, assignor to Ronald J. Hill, Bedford, Tex.
Filed Feb. 11, 1982, Ser. No. 348,099
Term of patent 14 years
U.S. Cl. D8—93

273,361
LOCKING TIE FOR FASTENING, BINDING OR THE LIKE
Tadashi Suzuki, 37-16, Oaza Fujikubo, Miyoshi-cho, Iruma-gun, Saitama-ken, Japan
Filed Jul. 22, 1981, Ser. No. 285,925
Claims priority, application Japan, Feb. 13, 1981, 56-5244
Term of patent 14 years
U.S. Cl. D8—394

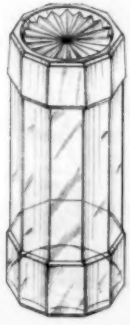
273,362
PACKAGING CONTAINER
Hisao Ishii, Fukuoka, Japan, assignor to Tokyo Hiyoko Co., Ltd., Tokyo, Japan
Filed Oct. 19, 1981, Ser. No. 312,630
Claims priority, application Japan, Apr. 27, 1981, 56-18101
Term of patent 14 years
U.S. Cl. D9—317

273,363
PACKAGING TRAY FOR WIRE LEADS
Walter Hagedorn, Ossining, and Bernard Ricci, Yonkers, both of N.Y., assignors to Stewart Stamping Corp., a Div. of Insilco Corp., Yonkers, N.Y.
Filed Aug. 10, 1981, Ser. No. 291,767
Term of patent 14 years
U.S. Cl. D8—341



273,364
BOTTLE
James H. Jalutkewicz, Pawcatuck; Richard D. Warrell, Mystic, and Richard B. Wetherell, Jr., Gales Ferry, all of Conn., assignors to Monsanto Company, St. Louis, Mo.
Filed Mar. 18, 1981, Ser. No. 244,992
Term of patent 14 years
U.S. Cl. D9—352

273,365
CONTAINER FOR COMESTIBLES
Sheila Lukins, and Julee Rosso, both of New York, N.Y., assignors to The Silver Palate, Inc., New York, N.Y.
Filed Aug. 27, 1981, Ser. No. 297,032
Term of patent 14 years
U.S. Cl. D9—400

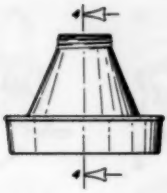


273,366
BOTTLE
Giancarlo Polenghi, Santo Stefano Lodigiano, Italy, assignor to L.A.S. s.a.s. di Polenghi Giancarlo & C., Milan, Italy
Filed Jul. 31, 1981, Ser. No. 288,868
Term of patent 14 years
U.S. Cl. D9—329

273,367
CONTAINER HANDLE OR SIMILAR ARTICLE
Thomas H. Hayes, Westport, Conn., assignor to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Jun. 3, 1981, Ser. No. 269,539
The portion of the term of this patent subsequent to Dec. 2, 1994, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—434

273,368
CONTAINER HANDLE OR SIMILAR ARTICLE
Thomas H. Hayes, Westport, Conn., assignor to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Jun. 3, 1981, Ser. No. 269,544
The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—434

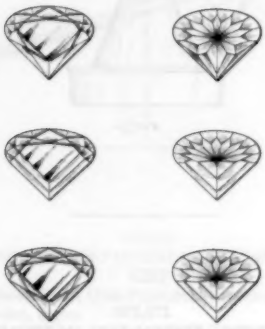
273,369
COMBINED POUR SPOUT AND DRIP GUARD
Carlo A. Fantozzi, 1515 Wilson Ave., Columbus, Ohio 43207
Continuation-in-part of Ser. No. 32,463, Apr. 23, 1979. This application May 6, 1981, Ser. No. 261,265
Term of patent 14 years
U.S. Cl. D9—436



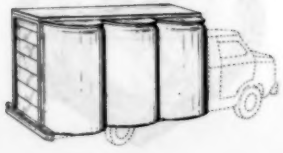
273,370
ELECTRONIC SYSTEM TEST INSTRUMENT
Randall N. Eilert, Bothell, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Aug. 26, 1980, Ser. No. 181,644
Term of patent 14 years
U.S. Cl. D10—75

273,371
EARRING FACE
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed May 6, 1981, Ser. No. 261,019
Claims priority, application Italy, Feb. 10, 1981, 35 554 B/81
Term of patent 14 years
U.S. Cl. D11—56

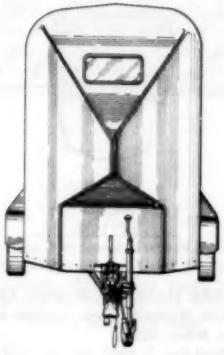
273,372
GEM
Francois Gennari, Paris, France, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Division of Ser. No. 114,967, Jan. 24, 1980, Pat. No. Des. 268,398. This application Jul. 30, 1981, Ser. No. 288,399
Claims priority, application France, Jul. 31, 1979, 42,679
Term of patent 14 years
U.S. Cl. D11—90

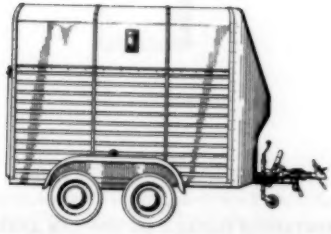


273,373
VEHICLE BODY
Allan Levine, 3028 Fallstaff Rd., Baltimore, Md. 21209; Robert Pinkner, 6 Ice Pond Ct., Baltimore, Md. 21208, and Robert Footlick, 8 Calypso Ct., Baltimore, Md. 21209
Filed Oct. 21, 1981, Ser. No. 313,708
Term of patent 14 years
U.S. Cl. D12—83



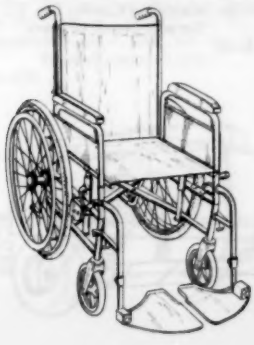
273,374
TRAILER
Trevor J. Dew, Leicester, England, assignor to Dunlop Limited, London, England
Filed Nov. 18, 1980, Ser. No. 207,887
Claims priority, application United Kingdom, May 27, 1980, 55-995025
Term of patent 14 years
U.S. Cl. D12—102



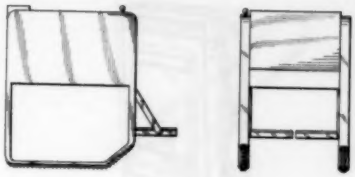


273,375
BICYCLE STEERING POST
Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Inc., Maysville, Ky.
Filed Jun. 12, 1980, Ser. No. 158,716
Term of patent 14 years
U.S. Cl. D12—118

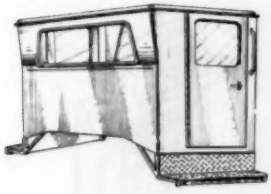
273,376
FOLDABLE WHEELCHAIR
Derek A. Charles, Four Marks, England, assignor to Vessa Limited, Hampshire, England
Filed Nov. 7, 1979, Ser. No. 91,884
Claims priority, application United Kingdom, May 10, 1979, 989862
Term of patent 14 years
U.S. Cl. D12—131



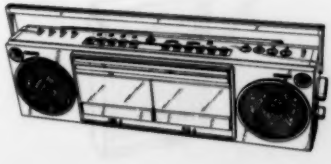
273,377
WHEELCHAIR OR SIMILAR ARTICLE
Bernard Kotyuk, New York, N.Y., assignor to Primary Design Group, Inc., New York, N.Y.
Filed Nov. 27, 1981, Ser. No. 325,170
Term of patent 14 years
U.S. Cl. D12—131



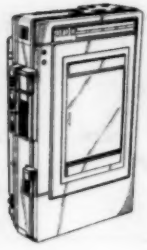
273,378
CREW CAB
Joseph A. Prusak, 145 DeVries Ave., North Tarrytown, N.Y. 10591
Filed May 3, 1982, Ser. No. 374,417
Term of patent 14 years
U.S. Cl. D12—156



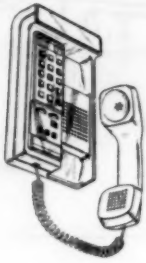
273,379
COMBINED PORTABLE RADIO AND CASSETTE TAPE RECORDER
Masanori Hamada; Akio Ohno, both of Osaka; Takao Okada, Kyoto, and Kikuo Ohta, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Oct. 22, 1981, Ser. No. 313,846
Claims priority, application Japan, Apr. 24, 1981, 56-17931
Term of patent 14 years
U.S. Cl. D14—5



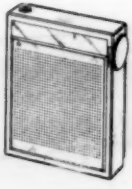
273,380
COMBINED RADIO AND CASSETTE TAPE RECORDER
Kazumasa Takenaka, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 22, 1981, Ser. No. 313,851
Claims priority, application Japan, Apr. 24, 1981, 56-17930
Term of patent 14 years
U.S. Cl. D14—5



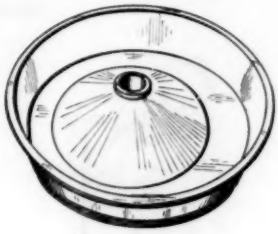
273,381
TELEPHONE
Takeshi Abe, Tokyo; Masato Shibayama, Mitaka; Yoshifumi Asakawa, Yokosuka, and Seiji Kinoshita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 19, 1981, Ser. No. 312,900
Term of patent 14 years
U.S. Cl. D14—53



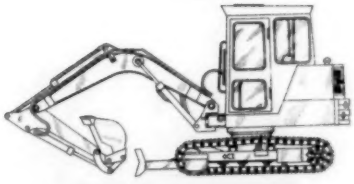
273,382
RADIO RECEIVER
Takao Okada, Kyoto, and Kikuo Ohta, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 10, 1981, Ser. No. 320,033
Claims priority, application Japan, May 18, 1981, 56-21463
Term of patent 14 years
U.S. Cl. D14—71



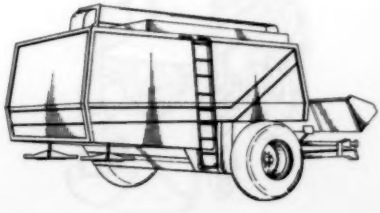
273,383
PUMP INTAKE MANIFOLD
Paul E. Griggs, Jr., 9900 Par La., Wichita, Kans. 67212
Filed Feb. 23, 1981, Ser. No. 237,267
Term of patent 14 years
U.S. Cl. D15—7



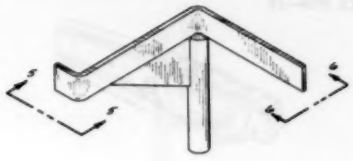
273,384
EARTH MOVING MACHINE
Hitoo Nasu; Yoshishioro Okita; Masami Hirooka; Yoshiaki Yanoshita; Yoshio Tomiyama, all of Sakai, and Kinichi Murata, Izumisano, all of Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Oct. 14, 1982, Ser. No. 434,296
Claims priority, application Japan, Apr. 27, 1982, 57-18709
Term of patent 14 years
U.S. Cl. D15—24



273,385
ROTARY COMBINE
Daniel Pakosh, Winnipeg, Canada, assignor to Versatile Corporation, Vancouver, Canada
Filed Mar. 23, 1981, Ser. No. 246,635
Claims priority, application Canada, Feb. 27, 1981, 270281
Term of patent 14 years
U.S. Cl. D15—27



273,386
TOOL REST FOR A LATHE
Morton S. Adler, 600 United Central Bank Building, Des Moines, Iowa 50309
Filed Aug. 3, 1981, Ser. No. 289,809
Term of patent 14 years
U.S. Cl. D15—138



273,387
CUTTER BIT
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260
Division of Ser. No. 7,100, Jan. 29, 1979, Pat. No. D. 263,598.
This application Jan. 9, 1981, Ser. No. 223,913
Term of patent 14 years
U.S. Cl. D15—139

273,388
CUTTER BIT
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260
Division of Ser. No. 7,100, Jan. 29, 1979, Pat. No. Des. 263,598.
This application Jan. 9, 1981, Ser. No. 223,915
Term of patent 14 years
U.S. Cl. D15—139

273,389
CUTTING BIT
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260
Division of Ser. No. 911,739, Jun. 2, 1978, Pat. No. Des. 262,219. This application Jan. 9, 1981, Ser. No. 223,916
Term of patent 14 years
U.S. Cl. D15—139

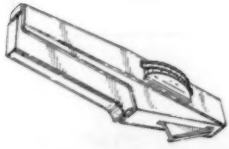
273,390
CUTTING BIT
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260
Division of Ser. No. 911,739, Jun. 2, 1978, Pat. No. Des. 262,219. This application Jan. 9, 1981, Ser. No. 223,918
Term of patent 14 years
U.S. Cl. D15—139

273,391
CUTTING BIT
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260
Division of Ser. No. 911,739, Jun. 2, 1978, Pat. No. Des. 262,219. This application Jan. 9, 1981, Ser. No. 223,919
Term of patent 14 years
U.S. Cl. D15—139

273,392
ELECTRONIC CALCULATOR
Keiji Sakata, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 24, 1982, Ser. No. 361,490
Claims priority, application Japan, Sep. 30, 1981, 56-43797
Term of patent 14 years
U.S. Cl. D18—7

273,393
ELECTRONIC CALCULATOR
Harumi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 3, 1982, Ser. No. 374,279
Claims priority, application Japan, Nov. 6, 1981, 56-49763
Term of patent 14 years
U.S. Cl. D18—7

273,394
EMBOSSING TOOL
James Lee, Oakland, Calif., assignor to Esselte Dymo N V, Belgium
Filed Mar. 9, 1982, Ser. No. 356,412
Claims priority, application United Kingdom, Sep. 9, 1981, 1002391
Term of patent 14 years
U.S. Cl. D18—19

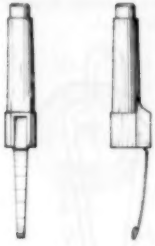


273,395
MULTIPLE POINT BALL POINT PEN
Steven K. Wilkinson, 2204 Zosimo Pl., Herndon, Va. 22070
Filed Apr. 30, 1982, Ser. No. 373,614
Term of patent 14 years
U.S. Cl. D19—36

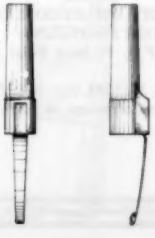
273,396
FOUNTAIN PEN
Daniel Hechter, 62, Avenue Foch, Paris XVT, France
Filed Oct. 7, 1981, Ser. No. 309,391
Claims priority, application France, Apr. 9, 1981, 81 1330
Term of patent 14 years
U.S. Cl. D19—49

273,397
FOUNTAIN PEN
Daniel Hechter, 62, Avenue Foch, Paris XVI, France
Filed Oct. 7, 1981, Ser. No. 309,394
Claims priority, application France, Apr. 9, 1981, 811330
Term of patent 14 years
U.S. Cl. D19—49

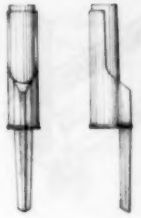
273,398
WRITING INSTRUMENT CAP
Clarence Zierhut, Richardson, Tex., assignor to The Gillette Company, Boston, Mass.
Filed Jun. 10, 1982, Ser. No. 387,087
Term of patent 14 years
U.S. Cl. D19—57



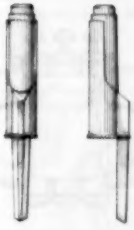
273,399
WRITING INSTRUMENT CAP
Clarence Zierhut, Richardson, Tex., assignor to The Gillette Company, Boston, Mass.
Filed Jun. 10, 1982, Ser. No. 387,088
Term of patent 14 years
U.S. Cl. D19—57



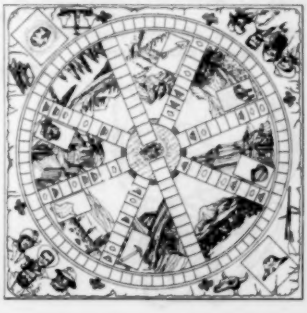
273,400
WRITING INSTRUMENT CAP
Clarence Zierhut, Richardson, Tex., assignor to The Gillette Company, Boston, Mass.
Filed Jun. 17, 1982, Ser. No. 389,323
Term of patent 14 years
U.S. Cl. D19—57



273,401
WRITING INSTRUMENT CAP
Clarence Zierhut, Richardson, Tex., assignor to The Gillette Company, Boston, Mass.
Filed Jun. 17, 1982, Ser. No. 389,324
Term of patent 14 years
U.S. Cl. D19—57

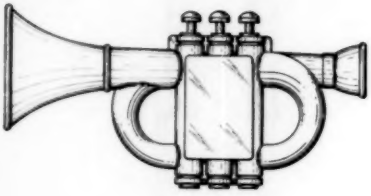


273,402
GAMEBOARD
Helen D. Adkins, Rte. 2, Box 575, Stewart Hollow Rd., Scioto-ville, Ohio 45662
Filed Jan. 25, 1982, Ser. No. 342,175
Term of patent 14 years
U.S. Cl. D21—35



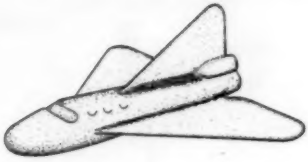
273,403
CHIP HOLDER
Joseph C. DeLuca, 214 Chapel Ave., Cherry Hill, N.J. 08034
Filed Mar. 18, 1981, Ser. No. 244,887
Term of patent 14 years
U.S. Cl. D21—56

273,404
TOY TRUMPET
Yuichi Takahashi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan
Filed Feb. 5, 1982, Ser. No. 346,286
Claims priority, application Japan, Aug. 31, 1981, 56-38443
Term of patent 14 years
U.S. Cl. D21—64

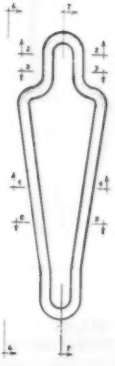


273,405
CHILD'S TOY RATTLE
David M. Raffo, and John A. Pape, both of Hitchin, England, assignors to Hestair Kiddicraft Limited, Surrey, England
Filed Mar. 8, 1982, Ser. No. 356,209
Claims priority, application United Kingdom, Dec. 3, 1981, 1003965
Term of patent 14 years
U.S. Cl. D21—65

273,406
TOY SPACE SHUTTLE
Albert G. Young, P.O. Box 966, Jupiter, Fla. 33408
Filed Jun. 22, 1981, Ser. No. 274,306
Term of patent 14 years
U.S. Cl. D21—87



273,407
EXERCISING DEVICE BODY
Roger C. Evans, 10214 Dogwood Ave., Palm Beach Gardens, Fla. 33410
Filed Apr. 6, 1981, Ser. No. 251,683
Term of patent 14 years
U.S. Cl. D21—191



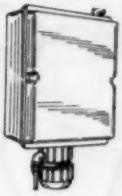
273,408
COMBINED WEIGHT AND RECOIL COMPENSATOR FOR SHOTGUNS
Louis J. Palmieri, R.F.D. Touisset Point Rd., Warren, R.I. 02885
Filed Feb. 26, 1982, Ser. No. 352,727
Term of patent 14 years
U.S. Cl. D22—7

273,409
COMBINED AQUARIUM FISHNET AND SUPPORT
Allan H. Willinger, New York, N.Y., assignor to Willinger Bros. Inc., Englewood, N.J.
Filed Jan. 21, 1981, Ser. No. 226,782
Term of patent 14 years
U.S. Cl. D22—22

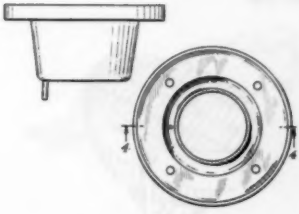
273,410
COMBINED FISH HOOK AND LINE DISPENSER AND STORAGE CONTAINER
Geza Tomosy, 626 Hillview Rd., Allentown, Pa. 18103
Filed Apr. 7, 1982, Ser. No. 366,170
Term of patent 14 years
U.S. Cl. D22—99

273,411
WATER PURIFICATION IONIC GAS GENERATOR
Dennis E. J. Johnson, and Scott J. Johnson, both of 1025 Garfield Ave., Aurora, Ill. 60506
Filed Aug. 27, 1982, Ser. No. 412,307
Term of patent 14 years
U.S. Cl. D23—3

273,412
WATER PURIFICATION IONIC GAS GENERATOR
Dennis E. J. Johnson, and Scott J. Johnson, both of 1025 Garfield Ave., Aurora, Ill. 60506
Filed Sep. 29, 1982, Ser. No. 428,397
Term of patent 14 years
U.S. Cl. D23—3

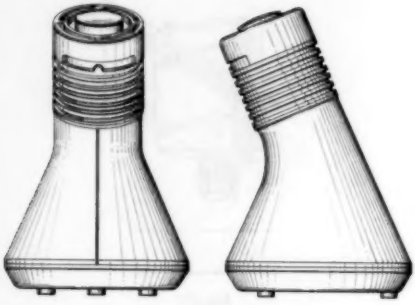


273,413
MOISTURE DIVERTING SLEEVE FOR TOILET DRAINPIPE
Kenneth E. McMurray, 3411 Buckner Dr., San Jose, Calif. 95127
Filed Oct. 19, 1981, Ser. No. 312,514
Term of patent 14 years
U.S. Cl. D23—69



273,414
SHELL FOR INDUCED DRAFT COOLING TOWER
Joachim R. Sinek, Hudson, Ohio, assignor to Kennecott Corporation, Cleveland, Ohio
Filed Dec. 3, 1981, Ser. No. 326,948
Term of patent 14 years
U.S. Cl. D23—139

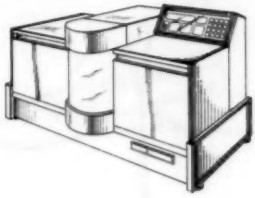
273,415
FACIAL SAUNA
Meyrick K. Rogers, Lancaster, Pa., assignor to Clairol Incorporated, New York, N.Y.
Filed Jun. 23, 1981, Ser. No. 276,575
Term of patent 14 years
U.S. Cl. D23—148



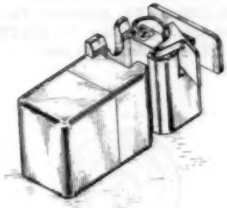
273,416
FAN
Arthur J. Scotto, 619 Shore Rd., N. Palm Beach, Fla. 33408
Filed May 11, 1983, Ser. No. 493,650
Term of patent 14 years
U.S. Cl. D23—156

273,417
FAN HOUSING COVER
William A. Conner, 114 Fourteenth St., Ramona, Calif. 92065
Filed Dec. 7, 1981, Ser. No. 328,463
Term of patent 14 years
U.S. Cl. D23—163

273,418
SLIDE SPINNER
Kenneth D. Collister, and Mohammad Kheiri, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed Oct. 19, 1981, Ser. No. 312,787
Term of patent 14 years
U.S. Cl. D24—1.1

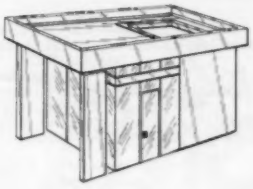


273,419
FLOW DETECTOR FOR AN INTRAVENOUS ADMINISTRATION SET
Herbert F. D'Alo, Crystal Lake; Joseph N. Genese, and Ronald W. Smith, both of Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Nov. 30, 1981, Ser. No. 325,709
Term of patent 14 years
U.S. Cl. D24—8

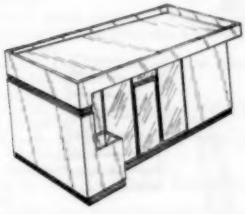


273,420
KNEE BRACE
Robert Gruber, Cincinnati, Ohio, assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio
Filed Feb. 10, 1982, Ser. No. 347,515
Term of patent 14 years
U.S. Cl. D24—64

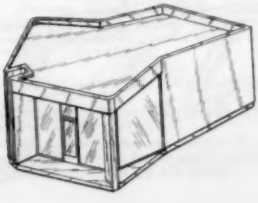
273,421
WALK-IN AUTOMATIC TELLER BUILDING
Randall L. Elliott, Oklahoma City, Okla., assignor to Vector Specialized Construction, Inc., Oklahoma City, Okla.
Filed Mar. 3, 1982, Ser. No. 354,221
Term of patent 14 years
U.S. Cl. D25—33



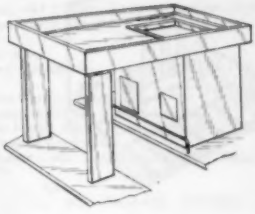
273,422
WALK-IN AUTOMATIC TELLER BUILDING
Randall L. Elliott, Oklahoma City, Okla., assignor to Vector Specialized Construction, Inc., Oklahoma City, Okla.
Filed Mar. 3, 1982, Ser. No. 354,222
Term of patent 14 years
U.S. Cl. D25—33



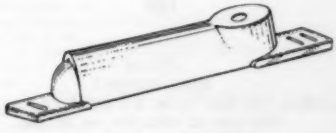
273,423
WALK-IN AUTOMATIC TELLER BUILDING
Randall L. Elliott, Oklahoma City, Okla., assignor to Vector Specialized Construction, Inc., Oklahoma City, Okla.
Filed Mar. 3, 1982, Ser. No. 354,234
Term of patent 14 years
U.S. Cl. D25—33



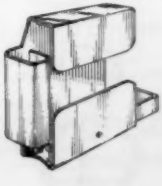
273,424
DRIVE-UP AUTOMATIC TELLER BUILDING
Randall L. Elliott, Oklahoma City, Okla., assignor to Vector Specialized Construction, Inc., Oklahoma City, Okla.
Filed Mar. 3, 1982, Ser. No. 354,235
Term of patent 14 years
U.S. Cl. D25—33



273,425
FLASHLIGHT
Andrew E. Campbell, 3233 Skyway Dr., Santa Maria, Calif. 93455, and Jack LeVan, 17401 Mt. Cliffwood Cir., Fountain Valley, Calif. 92708
Filed Apr. 8, 1981, Ser. No. 252,185
Term of patent 14 years
U.S. Cl. D26—37



273,426
COMBINED HOLDER FOR A CIGARETTE PACK AND LIGHTER
Anchel Zucker, 20 Memory Lane Pkwy., North Syracuse, N.Y. 13212
Filed Jun. 12, 1980, Ser. No. 158,739
Term of patent 14 years
U.S. Cl. D27—49



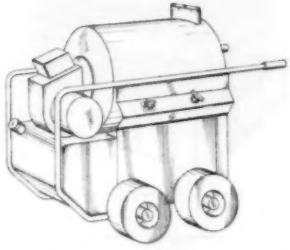
273,427
HAIR SETTING CASE
George Barradas, Greenwich, Conn., assignor to Appliance Design Probe Inc., Scarborough, Canada
Filed Mar. 16, 1981, Ser. No. 243,785
Term of patent 14 years
U.S. Cl. D28—38

273,428
TRIM RAZOR
James A. Ferretti, 203 Salina St., Liverpool, N.Y. 13088
Filed Aug. 25, 1982, Ser. No. 411,573
Term of patent 14 years
U.S. Cl. D28—46

273,429
BIRD FEEDER
Peter Kilham, Mill Rd., Foster, R.I. 02825
Filed Apr. 12, 1982, Ser. No. 367,246
Term of patent 14 years
U.S. Cl. D30—15

273,430
ANIMAL FEEDER
Rufus C. Salinas, 19321 Ramsey Rd., Crosby, Tex. 77532
Filed Feb. 8, 1982, Ser. No. 357,491
Term of patent 14 years
U.S. Cl. D30—16

273,431
OIL FIRED HOT WATER PRESSURE CLEANING APPARATUS
Paul W. Linton, 2722 SE. Evans, Troutdale, Oreg. 97060
Filed Jul. 2, 1981, Ser. No. 279,729
Term of patent 14 years
U.S. Cl. D32—15



273,432
BLIND CLEANER
Jeff A. Jacobson, 22 Woodgrove, Irvine, Calif. 92714
Filed Aug. 1, 1983, Ser. No. 519,023
Term of patent 14 years
U.S. Cl. D32—52

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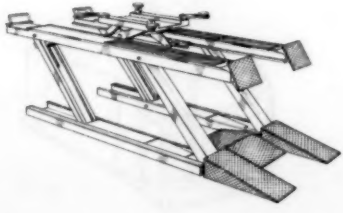
VEHICLE LIFT
Saburo Masui, Tokyo, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan
Filed Sep. 28, 1981, Ser. No. 306,973
Term of patent 14 years
U.S. Cl. D34—28



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TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF APRIL, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A/S Niro Atomizer: *See*—
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Baker, Don R.; and Gutman, Arnold D., to Stauffer Chemical Company. Haloalkyloxime herbicidal antidotes. 4,441,916, Cl. 71-100.000.

Baker, Geoffrey; and Lockett, Roger A., to U.S. Philips Corporation. Differential radiation detection apparatus. 4,442,357, Cl. 250-338.000.

Baker, Newman T. Anchor device for bass drum. 4,441,398, Cl. 84-421.000.

Baldwin, John J.: *See—*
Atkinson, Joseph G.; Baldwin, John J.; and McClure, David E., 4,442,094, Cl. 424-246.000.

Balmar Crimp Tool Corp.: *See—*
Manor, Henry A., 4,441,388, Cl. 81-300.000.

Balzano, Quirino: *See—*
Siwiak, Kazimierz; Garay, Oscar M.; and Balzano, Quirino, 4,442,438, Cl. 343-792.000.

Ban, Kaoru: *See—*
Takegami, Shinsuke; Ban, Kaoru; and Wakitani, Mitsuru, 4,442,173, Cl. 428-372.000.

Bang & Olufsen A/S: *See—*
Baekgaard, Knud E., 4,442,434, Cl. 343-701.000.

Banov, Mikhail D.: *See—*
Oshkin, Anatoly I.; Banov, Mikhail D.; and Chernyshev, Alexandr N., 4,442,312, Cl. 174-15.0WF.

Barber-Greene Co.: *See—*
Burkhart, George M.; and Dohnalik, Martin F., 4,441,821, Cl. 366-61.000.

Barcza, Nicholas A.: *See—*
Curr, Thomas R.; and Barcza, Nicholas A., 4,441,921, Cl. 75-10.00R.

Barnard, Richard H., to ITT Industries, Inc. Vortex flowmeter. 4,441,372, Cl. 73-861.220.

Barnes, Adrian G.: *See—*
Mitchell, Terence G.; Barnes, Adrian G.; Jackson, Julia S.; and Bevan, Peter C., 4,441,514, Cl. 131-276.000.

Barnes-Hind/Hydrocurve, Inc.: *See—*
Lim, Drahoslav, 4,442,141, Cl. 427-164.000.

Barrable, Victor E.: *See—*
McQueen, George; and Barrable, Victor E., 4,441,293, Cl. 52-377.000.

Barrett, Joseph A. F., to ICI Americas Inc. Liquid desensitized, electrically activated detonator assembly resistant to actuation by radio-frequency and electrostatic energies. 4,441,427, Cl. 102-202.600.

Barsotti, Mario. Table saw guide apparatus. 4,441,394, Cl. 83-409.000.

Bartch, Donald W.: *See—*
Poff, Wayne R.; and Bartch, Donald W., 4,441,957, Cl. 156-656.000.

Bartel, Siegfried; Ermer, Wolfgang; and Payrhammer, Bernd, to AGFA-Gevaert AG. Cassette for winding band-like photographic material. 4,441,667, Cl. 242-197.000.

Bartels-Keith, James R.; and Puttick, Anthony J., to Polaroid Corporation. Development restrainer release compounds. 4,442,290, Cl. 544-310.000.

Barter, Archie M., to Tektronix, Inc. CRT Video drive circuit with beam current stabilization. 4,442,458, Cl. 358-243.000.

Bartsch, Heinz: *See—*
Lux, Werner; Vahlensieck, Jurgen; Zell, Jakob; Hermann, Bodo; Bartsch, Heinz; and Zimmermann, Horst, 4,442,334, Cl. 219-73.000.

Bartz, Gisela. Method and apparatus for attracting useful insects. 4,441,272, Cl. 43-1.000.

Bartz, Stephen A., to Lucht Engineering, Inc. Photographic printing system including an improved masking card. 4,441,807, Cl. 355-40.000.

Base Ten Systems, Inc.: *See—*
James, Rolland T.; and Chebra, Ronald J., 4,442,320, Cl. 179-5.00R.

BASF Aktiengesellschaft: *See—*
Brandstetter, Franz; Hambrecht, Juergen; Stephan, Rudolf; Overhoff, Heinz-Juergen; Schwaab, Josef; Bernhard, Claus; Swoboda, Johann; and Echte, Adolf, 4,442,263, Cl. 525-83.000.
Degner, Dieter; and Hannebaum, Heinz, 4,441,970, Cl. 204-59.00R.
Hartwig, Ernst; and Krallmann, Reinhold, 4,442,287, Cl. 544-187.000.
Marx, Hans-Norbert; and Gottache, Reimer, 4,442,157, Cl. 428-173.000.
Mueller, Herbert; Axel, Hartmut; and Wittwer, Arnold, 4,442,306, Cl. 564-479.000.
Prinzbach, Horst; Schwesinger, Reinhard; and Keller, Reinhold, 4,442,299, Cl. 549-545.000.
Rau, Wolfgang; Klamann, Helmut; and Hennenberger, Peter, 4,442,271, Cl. 526-61.000.

Basile, Raffaele: *See—*
Hijuelos, Humberto; Scartozzi, Giulio; Vollmuth, Lawrence P.; and Basile, Raffaele, 4,441,238, Cl. 29-33.00D.

Bassier, Friedrich; and Goldschmidt, Klaus, to Ruhrkohle AG; and Steag AG. Process for the disposal and economic use of the residue of the exhaust gas washers of furnaces in relation to waste products. 4,441,840, Cl. 405-267.000.

Baubron, Jean-Claude C., to Bureau de Recherches Geologiques et Minieres. High-precision method and apparatus for in-situ continuous measurement of concentrations of gases and volatile products. 4,442,353, Cl. 250-281.000.

Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, to Degussa Aktiengesellschaft. Process for removal of sand mold residues from cast parts. 4,441,930, Cl. 134-2.000.

Bauer, Clint E.: *See—*
Kongable, Lowell S.; and Bauer, Clint E., 4,442,500, Cl. 364-724.000.

Bauer, Georg: *See—*
Zolner, Dieter H.; Rittmann, Friedrich; Dung, Herbert; Haremsa, Johannes; Bauer, Georg; Otto, Josef; Muhlenbeck, Josef; and Lauterbach-Dammler, Inge, 4,442,525, Cl. 373-93.000.

Baugh, John L.; and Montgomery, James W., to Hughes Tool Company. Setting tool. 4,441,560, Cl. 166-382.000.

Baumann, Hans-Peter; and Mosimann, Urs, to Sandoz Ltd. Quaternary ammonium compounds and their use as dyeing assistants for polyamide fibers. 4,441,884, Cl. 8-542.000.

Baumann, Heinz; Kuhnel, Werner; and Rattner, Manfred, to Siemens Aktiengesellschaft. Resonant circuit inverter. 4,442,483, Cl. 363-131.000.

Baumard, Ulysse, to Etablissements Briand S.A. Single or multiple head for extraction of bulk materials. 4,441,603, Cl. 198-518.000.

Baumen, William C.: *See—*
Lee, John M.; Baumen, William C.; Wolcott, Richard A.; and Burba, John L., III, 4,442,230, Cl. 521-28.000.

Baumgardner, H. Richard: *See—*
McDaniel, Charles R.; and Baumgardner, H. Richard, 4,441,258, Cl. 33-179.000.

Baxter Travenol Laboratories, Inc.: *See—*
Tune, Joel A., 4,441,620, Cl. 215-232.000.

Bayer Aktiengesellschaft: *See—*
Fauss, Rudolf; Sonntag, Michael; Wagner, Kuno; Findeisen, Kurt; and Mennicken, Gerhard, 4,442,279, Cl. 528-44.000.
Grogler, Gerhard; and Kallert, Wilhelm, 4,442,280, Cl. 528-54.000.
Meyer, Horst; Sitt, Rudiger; Thomas, Gunter; Garthoff, Benward; Towart, Robertson; and Rosentreter, Ulrich, 4,442,100, Cl. 424-250.000.
Probst, Joachim; Riberi, Bernd; Kolb, Gunter, deceased; and Hohlein, Peter, 4,442,145, Cl. 427-385.500.
Rasshofer, Werner; Schafer, Hermann; Paul, Reiner; and Beuth, Josef, 4,442,236, Cl. 521-130.000.
Zabrocki, Karl; and Pischtschan, Alfred, 4,442,264, Cl. 525-86.000.

Bayer, Josef: *See—*
Mehlan, Bernd; and Bayer, Josef, 4,441,628, Cl. 221-90.000.

Bayerische Motoren Werke A.G.: *See—*
Wimmer, Robert; and Levai, Laslo, 4,441,737, Cl. 280-804.000.

Beard, Walter C. Direct high flow aerosol-type valve with moveable cup. 4,441,635, Cl. 222-402.220.

Bechtold, Stephen K. Double dome skylight assembly. 4,441,284, Cl. 52-72.000.

Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., to Miller Brewing Company. Pasteurization apparatus. 4,441,406, Cl. 99-275.000.

Beckmann, Georg, to Waagner Biro Aktiengesellschaft. Method and apparatus for cooling hot bulk material. 4,441,261, Cl. 34-20.000.

Becton Dickinson and Company: *See—*
Christinger, Werner, 4,441,951, Cl. 156-245.000.
Hicawa, Daniel, 4,441,495, Cl. 128-325.000.

Beecham Group Limited: *See—*
Crowley, Patrick J., 4,441,609, Cl. 206-204.000.

Gardner, Derek V.; and Gaster, Laramie M., 4,442,098, Cl. 424-248.510.

Beeley, Nigel R. A.; Cremer, Gerard; Dimsdale, Michael J.; and Manoury, Philippe, to Synthelabo. 1,2,3,4-Tetrahydronaphthalene derivatives. 4,442,126, Cl. 424-324.000.

Beentjes, Nicolaas H.; and Gootjes, Peter, to Estel Hoogovens B.V. Apparatus for supporting and guiding a sub-lance. 4,441,701, Cl. 266-287.000.

Behringwerke Aktiengesellschaft: *See*—
Heber, Helmut; Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Schick, Manfred, 4,442,213, Cl. 435-217.000.
Kolar, Cenek; Paulsen, Hans; and Jacquinet, Jean C., 4,442,284, Cl. 536-17.900.

Beierholm, Hans M.; and Henriksen, Niels J., to Danfoss A/S. Inverter circuit for operating a speed-controllable asynchronous motor. 4,442,394, Cl. 318-807.000.

Beijboom, Peter: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,441,591, Cl. 188-202.000.

Beinglass, Israel: *See*—
Gargini, Paolo; Beinglass, Israel; and Ahlquist, Norman, 4,441,247, Cl. 29-571.000.

Beldam, Richard P.: *See*—
Argyle, Charles S.; Beldam, Richard P.; and Hope, Robert J., 4,441,547, Cl. 165-67.000.

Belgorodsky Zavod Energeticheskogo Mashinostroenia: *See*—
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,441,549, Cl. 165-145.000.

Bell & Howell Company: *See*—
Hams, Kenneth A., 4,442,347, Cl. 235-474.000.

Bell Telephone Laboratories, Incorporated: *See*—
Ahuja, Bhupendra K.; and Dwarakanath, Mirmira R., 4,442,529, Cl. 375-34.000.
Allen, Jonathan B., 4,442,540, Cl. 381-31.000.
Alspector, Joshua; Kinsbron, Eliezer; and Sternheim, Marek A., 4,441,249, Cl. 29-577.00C.
Besomi, Paul R.; Degani, Joshua; and Wilt, Daniel P., 4,442,402, Cl. 324-158.00D.
Chu, Ta-Shing; and England, Robert W., 4,442,437, Cl. 343-786.000.
Levin, Rafael M., 4,441,931, Cl. 148-1.500.
Weinraub, William C. L., 4,441,309, Cl. 57-212.000.

Belletire, John L.; and Sarges, Reinhard, to Pfizer Inc. Imide derivatives. 4,442,114, Cl. 424-267.000.

Belsky, Don M.: *See*—
Belsky, Jerome; and Belsky, Don M., 4,441,731, Cl. 280-495.000.

Belsky, Jerome; and Belsky, Don M. Towing system for vehicles with rear bumpers. 4,441,731, Cl. 280-495.000.

Bendix Corporation, The: *See*—
Brown, Arthur K., 4,441,319, Cl. 60-548.000.
Gaiser, Robert F., 4,441,320, Cl. 60-578.000.
Mead, Ronald C., 4,442,513, Cl. 367-100.000.

Beneke, Wolfgang; and Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Apparatus for separating foreign bodies from fiber tufts. 4,441,994, Cl. 209-139.00R.

Bennett, Garry K. Cable tension gluing process. 4,442,149, Cl. 428-53.000.

Bennett, Robert A. Child resistant trigger pump. 4,441,633, Cl. 222-153.000.

Benson, Henry E., to Architectural Specialties Co., Inc. Garage door panel apparatus and method. 4,441,301, Cl. 52-804.000.

Bentz, Rolf; and Schori, Christian, to Ciba-Geigy Corporation. Process for recovering organic substances from spent air vapors. 4,441,896, Cl. 55-85.000.

Berelson, Rudolph. Peristaltic pump. 4,441,867, Cl. 417-475.000.

Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, to Boehringer Mannheim GmbH. Azo dyestuff for use as a chromogen in detecting leukocytes. 4,442,033, Cl. 260-158.000.

Berger, Leo; and Olson, Gary L., to Hoffmann-La Roche Inc. 1,2,3,4,4a,7-Hexahydro-6,8-dimethoxy-2-methyl isoquinoline. 4,442,291, Cl. 546-150.000.

Bergmann, Wilfried H. Method and means for the noninvasive, local, in-vivo examination of endogeneous tissue, organs, bones, nerves and circulating blood on account of spin-echo techniques. 4,442,404, Cl. 324-309.000.

Berkley and Company, Inc.: *See*—
McMickle, Robert L.; and Rumbaugh, James T., 4,441,273, Cl. 43-18.100.
McMickle, Robert L.; and Foote, Danny R., 4,441,453, Cl. 119-3.000.

Bernauer, Otto; Holzt, Hans-Peter; and Lenz, Hermann, to Daimler-Benz Aktiengesellschaft. Process for cooling the passenger compartments of vehicles with hydrogen-consuming engines by mechanical refrigerating procedure. 4,441,326, Cl. 62-7.000.

Bernhard, Claus: *See*—
Brandstetter, Franz; Hambrecht, Juergen; Stephan, Rudolf; Overhoff, Heinz-Juergen; Schwaab, Josef; Bernhard, Claus; Swoboda, Johann; and Echte, Adolf, 4,442,263, Cl. 525-83.000.

Bernier, Jean P. Device for immobilizing a wheeled vehicle. 4,441,586, Cl. 188-32.000.

Bertails, Jean-Claude; and Perrin, Christian, to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux-E.F.C.I.S. Integrated circuit generator in CMOS technology. 4,442,398, Cl. 323-315.000.

Berthiaume, Clement E.: *See*—
Trumble, William P.; Martin, Ivan E.; and Berthiaume, Clement E., 4,441,213, Cl. 2-161.00R.

Besomi, Paul R.; Degani, Joshua; and Wilt, Daniel P., to Bell Telephone Laboratories, Incorporated. Photoluminescence method of testing double heterostructure wafers. 4,442,402, Cl. 324-158.00D.

Bessho, Takeshi: *See*—
Kiryu, Rikio; and Bessho, Takeshi, 4,442,435, Cl. 343-709.000.

Betts, Max W.; and Robinson, Frank, to Courtaulds PLC. Presser foot device for a knitting machine. 4,441,338, Cl. 66-64.000.

Betz Entec, Inc.: *See*—
O'Leary, Richard P.; and Reichgott, David W., 4,442,009, Cl. 210-697.000.

Beuth, Josef: *See*—
Rasshofer, Werner; Schafer, Hermann; Paul, Reiner; and Beuth, Josef, 4,442,236, Cl. 521-130.000.

Bevan, Peter C.: *See*—
Mitchell, Terence G.; Barnes, Adrian G.; Jackson, Julia S.; and Bevan, Peter C., 4,441,514, Cl. 131-276.000.

Beyhl, Eberhard F.: *See*—
Bosinger, Gerhard; Backes, Michael; and Beyhl, Eberhard F., 4,442,346, Cl. 235-379.000.

Bhatti, Mohinder S., to Owens-Corning Fiberglas Corporation. Method of making glass fiber forming feeders and feeder formed thereby. 4,441,903, Cl. 65-1.000.

Bhatti, Mohinder S., to Owens-Corning Fiberglas Corporation. Method of making glass fiber forming feeders and feeder formed thereby. 4,441,904, Cl. 65-1.000.

Biaggi, Jacques, to MacGregor International, S.A. Port ramp for access to a roll-on roll-off ship. 4,441,449, Cl. 114-263.000.

Bianchi, Nereo, to NECCHI. Needle bar drive in sewing machines. 4,441,441, Cl. 112-221.000.

Biberbach, Peter: *See*—
Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, 4,441,930, Cl. 134-2.000.

BICC Public Limited Company: *See*—
Dey, Philip, 4,442,364, Cl. 307-147.000.

Bich, George J.; Burke, Thomas M.; and Smith, James D. B., to Westinghouse Electric Corp. Substrate pretreatment with a metal-beta keto ester complex in the method of curing an anaerobic resin. 4,442,138, Cl. 427-116.000.

Biffle, Morris S. Modified rotating head assembly for rotating blowout preventors. 4,441,551, Cl. 166-84.000.

Biohol Corporation: *See*—
Roth, Ernest R., 4,441,891, Cl. 44-56.000.

Bisco, Inc.: *See*—
Suh, Byoung I., 4,442,240, Cl. 523-116.000.

Bishop, Keith C., III; Earls, David E.; Robinson, Richard C.; Blakely, Donald W., deceased; and by Jacobson, Robert L., administrator, to Chevron Research Company. Process for regenerating a spent copper composite sulfur sorbent. 4,442,221, Cl. 502-25.000.

Biswas, Bimal K.; and Kochie, Joseph E., to Foster Wheeler Energy Corporation. Apparatus for mixing and distributing solid particulate material. 4,441,822, Cl. 366-101.000.

Bither, Tom A., Jr., to Du Pont de Nemours, E. I., and Company. Catalyst for vapor phase oxidation of n-butane to maleic anhydride. 4,442,226, Cl. 502-209.000.

Black & Decker Inc.: *See*—
Cuneo, Giuseppe, 4,442,366, Cl. 310-50.000.
Walton, Richard E., II, 4,441,563, Cl. 173-163.000.

Blakely, Donald W., deceased: *See*—
Bishop, Keith C., III; Earls, David E.; Robinson, Richard C.; Blakely, Donald W., deceased; and Jacobson, Robert L., administrator, 4,442,221, Cl. 502-25.000.

Blanchard, Senior N.; Flint, William T.; Tibbetts, George C.; and Sawyer, Joseph A., to Tibbetts Industries, Inc. Encapsulated backplate for electret transducers. 4,442,324, Cl. 179-111.00E.

Blaschke, Kurt; and Roob, Josef, to Stahl- und Apparatebau Hans Leffer GmbH. Elevator for casing. 4,441,749, Cl. 294-88.000.

Bleakney, William M., to Hughes Aircraft Company. Airborne missile guidance system. 4,442,431, Cl. 343-7.0ED.

Bless, Franz: *See*—
Limque, Ferdinand; Luiten, Cornelis H.; Bless, Franz; Neubauer, Reinhard; and Lange, Dietmar, 4,441,698, Cl. 266-249.000.

Block, Franz-Rudolf, to Arbed S.A. Method of and apparatus for determining the melt level in a continuous-casting mold. 4,441,541, Cl. 164-453.000.

Blom, Sture R.; and Osborne, Theodore M., to Baird Corporation. Circuitry for the generation and synchronous detection of optical pulsed signals. 4,442,349, Cl. 250-222.100.

Bloomer, Ivan, to Haden Schweitzer Corporation. Apparatus for ensuring heat exchange between a gas flow and a heat exchanger. 4,442,049, Cl. 261-148.000.

Blumberg, Morris; and Swasey, Chester C., to Sandoz, Inc. Additive blends for polymeric materials. 4,442,017, Cl. 252-301.210.

Blumhardt, Harold, to Blumhardt Manufacturing Co. Agricultural spraying apparatus. 4,441,655, Cl. 239-163.000.

Blumhardt Manufacturing Co.: *See*—
Blumhardt, Harold, 4,441,655, Cl. 239-163.000.

Bochot, Jean C., to Valeo. Reaction assembly for a torque converter and a torque converter comprising such a reaction assembly. 4,441,315, Cl. 60-345.000.

Bocklage, Casper J., Jr.: *See*—
Lenderking, Bruce N.; and Bocklage, Casper J., Jr., 4,442,476, Cl. 361-395.000.

Boda, James C., to Brunswick Corporation. Cable connection. 4,441,836, Cl. 403-154.000.

Bodega, Sergio, to Tubettificio Ligure S.p.A. Process for manufacturing thin unitary hollow metal bodies. 4,441,354, Cl. 72-342.000.

Bodie, Elizabeth A.: *See*—
Schwartz, Robert D.; and Bodie, Elizabeth A., 4,442,128, Cl. 426-41.000.

Boehringer Ingelheim KG: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,442,120, Cl. 424-282.000.

Boehringer Ingelheim K.G.: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,442,121, Cl. 424-282.000.

Boehringer Mannheim GmbH: *See*—
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,442,033, Cl. 260-158.000.
Michel, Helmut; Kampe, Wolfgang; and Ofenloch, Roland, 4,442,295, Cl. 548-505.000.

Boehringer, Wilfred E.; and Verhoeven, Teunes, to McDonnell Douglas Corporation. High lift surface actuation system. 4,441,675, Cl. 244-213.000.

Boeing Company, The: *See*—
Franklin, James L.; and Watkins, Dale F., 4,441,548, Cl. 165-104.260.

Boelens, Harmannus; van der Weerdt, Antonius J. A.; and Hesp, Theodorus G. M., to Naarden international, N.V. Perfume compositions and perfumed articles containing esters of substituted bicyclo [2.2.1]heptene- and heptine-carboxylic acids as perfume base. 4,442,025, Cl. 252-522.00R.

Bohl, Thomas L., to Babcock & Wilcox Company, The. Temperature actuated air flow control and gas sampler. 4,441,356, Cl. 73-23.000.

Boisen, Henrik: *See*—
Vognsen, Anders M.; and Boisen, Henrik, 4,442,215, Cl. 435-262.000.

Boller, Edward, to Hydrovane Compressor Company Limited. Rotary compressors with primary and secondary oil separation means. 4,441,871, Cl. 418-97.000.

Bon-Mardion, Gilbert; Claudet, Gerard; and Lacaze, Albert, to Commissariat a l'Energie Atomique. Refrigerating or heat pumping process and apparatus. 4,441,325, Cl. 62-3.000.

Bonne, Ulrich, to Honeywell Inc. Heat pump. 4,441,335, Cl. 62-324.600.

Bonsack, James P., to SCM Corporation. Entrained downflow chlorination of fine titaniferous material. 4,442,076, Cl. 423-78.000.

Boots Company Limited, The: *See*—
Davies, Roy V., 4,442,109, Cl. 424-258.000.

Borg-Warner Corporation: *See*—
Argyle, Charles S.; Beldam, Richard P.; and Hope, Robert J., 4,441,547, Cl. 165-67.000.
Lamarche, Paul E., 4,441,595, Cl. 192-3.290.
Underwood, Herbert N., 4,441,729, Cl. 280-278.000.

Borisov, Nikolai L.: *See*—
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,441,549, Cl. 165-145.000.

Borner, Alfred. Kitchen utensil for cutting fruit, vegetables and the like into strips and a blade therefor. 4,441,254, Cl. 30-124.000.

Boroschewski, Gerhard: *See*—
Arndt, Friedrich; and Boroschewski, Gerhard, 4,441,915, Cl. 71-100.000.

Borovicka, David A., Sr.; Hahn, Kenneth G., Jr.; and Tupa, John T., to SCM Corporation. Low temperature cure latexes. 4,442,257, Cl. 524-555.000.

Bosch, Jack L. Isometric exerciser belt for joggers and the like. 4,441,707, Cl. 272-119.000.

Bosinger, Gerhard; Backes, Michael; and Beyhl, Eberhard F. Money deposit and/or dispensing device. 4,442,346, Cl. 235-379.000.

Bouchard, Patrick M.; and King, Jack B., to General Motors Corporation. Supplementary fuel system for enhancing low temperature engine operation. 4,441,475, Cl. 123-525.000.

Bouiller, Jean G.: *See*—
Joubert, Raymond J. M.; and Bouiller, Jean G., 4,441,313, Cl. 60-262.000.

Bouley, Alan C.; Riedl, Harold R.; Jensen, James D.; and Jost, Steven R., to United States of America, Navy. Sensitized epitaxial infrared detector. 4,442,446, Cl. 357-30.000.

Boutin, Francois-Regis; and Kubie, Jan, to SCAL Societe de Conditionnements en Aluminium. Method of making products of aluminium alloy suitable for drawing. 4,441,933, Cl. 148-2.000.

Bouvard, Andre: *See*—
Hulin, Jean P.; Bouvard, Andre; and LeMaitre, Patrick, 4,441,786, Cl. 350-96.210.

Bouverot, Noel; Medard, Paul; and Viale, Alain, to Rhone-Poulenc Industries. Injection-molding of pasty, thermosetting organopolysiloxane compositions. 4,442,060, Cl. 264-328.200.

Bowman, Clyde L.; DeVries, Charles R.; and Saur, Charles W., to Lear Siegler, Inc. Mode changing means for accumulator conveyors. 4,441,607, Cl. 198-781.000.

Boyce, Norman A. Rigid building frame with inflatable member. 4,442,059, Cl. 264-228.000.

Boyd, Ronald J.: *See*—
Tipple, Neil A.; Gibson, Jerome W.; and Boyd, Ronald J., 4,441,831, Cl. 400-134.300.

Bracher, Gustav: *See*—
Burge, Theodor; and Bracher, Gustav, 4,442,021, Cl. 252-389.00R.

Bradley, Hugh W., Jr.: *See*—
Daws, John W.; Bradley, Hugh W., Jr.; and Canfield, Sheldon A., 4,441,367, Cl. 73-597.000.

Bradley, William: *See*—
Huie, Nicholas C.; and Bradley, William, 4,441,657, Cl. 241-14.000.

Bradshaw, John: *See*—
Clitherow, John W.; Bradshaw, John; Mackinnon, John W. M.; Price, Barry J.; Martin-Smith, Michael; and Judd, Duncan B., 4,442,110, Cl. 424-263.000.

Brahmbhatt, Dhaval J., to Honeywell Inc. Low power decoder circuit. 4,442,481, Cl. 363-60.000.

Brahme, Anders, to Instrument AB Scanditronix. Scanning system for charged and neutral particle beams. 4,442,352, Cl. 250-251.000.

Brandenburg, Robert C.: *See*—
Miller, Jack E.; and Brandenburg, Robert C., 4,441,606, Cl. 198-751.000.

Brandstetter, Franz; Hambrecht, Juergen; Stephan, Rudolf; Overhoff, Heinz-Juergen; Schwaab, Josef; Bernhard, Claus; Swoboda, Johann; and Echte, Adolf, to BASF Aktiengesellschaft. Thermoplastic molding materials. 4,442,263, Cl. 525-83.000.

Brandt Armements: *See*—
Crepin, Roger, 4,441,670, Cl. 244-3.220.

Brau, Charles A.; Kurnit, Norman A.; and Cooper, Richard K., to United States of America, Energy. Circular free-electron laser. 4,442,522, Cl. 372-2.000.

Brauer, Eric A., to RCA Corporation. Stylus protecting mechanism for video disc player. 4,442,517, Cl. 369-71.000.

Braun, Franz: *See*—
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,442,033, Cl. 260-158.000.

Breider, Edmund J., to Linde Aktiengesellschaft. Method of and apparatus for the biological decontamination of waste water. 4,442,005, Cl. 210-614.000.

Brembo S.p.A.: *See*—
Giorgetti, Alberto, 4,441,590, Cl. 188-195.000.

Brentham, Jerry D. Double leg curl exercising device. 4,441,708, Cl. 272-130.000.

Brezec, Joze: *See*—
Hrovatin, Albert; and Brezec, Joze, 4,441,443, Cl. 112-258.000.

Brezosky, Bernard J., to General Electric Company. Appliance anti-tip device. 4,441,770, Cl. 312-276.000.

Bricks, Bernard G., to United States of America, Air Force. High power metal vapor laser. 4,442,523, Cl. 372-56.000.

Briggs, Anglis R., to Du Pont de Nemours, E. I., and Company. Monothioglycerol as thiol-protector in lyophilized materials. 4,442,212, Cl. 435-188.000.

Briggs, Peter J.; McAloon, Kevin; and Rideal, Graham R., to Imperial Chemical Industries Ltd. Fibrous composite materials and the production and use thereof. 4,442,164, Cl. 428-283.000.

Brigham, Alan, to Raychem Corporation. Elements comprising fibrous materials. 4,442,139, Cl. 427-122.000.

Briski, Lawrence M.: *See*—
Ostroski, Joseph; and Briski, Lawrence M., 4,441,602, Cl. 194-100.00A.

Brister, Beryle D., to Brister, Incorporated. Method and apparatus for forming a temporary plug in a submarine conduit. 4,441,328, Cl. 62-53.000.

Brister, Incorporated: *See*—
Brister, Beryle D., 4,441,328, Cl. 62-53.000.

British Aerospace Public Limited Company: *See*—
Carter, Walter S., 4,442,414, Cl. 332-7.510.
Rowarth, Ralph, 4,441,676, Cl. 244-234.000.
Thorby, Douglas C.; and Sullivan, Michael C. W., 4,441,671, Cl. 244-63.000.

British-American Tobacco Co., Ltd.: *See*—
Mitchell, Terence G.; Barnes, Adrian G.; Jackson, Julia S.; and Bevan, Peter C., 4,441,514, Cl. 131-276.000.

Broadhurst, Thomas E., to Exxon Research & Engineering Company. Dewaxing process using agitated heat exchanger to chill solvent-oil and wax slurry to wax filtration temperature. 4,441,987, Cl. 208-33.000.

Brochand, Max, to Pomagalski S.A. Aerial monocable transport installation. 4,441,430, Cl. 104-209.000.

Brodowski, Walter: *See*—
Hentschel, Peter; Brodowski, Walter; and Zengel, Hans, 4,442,281, Cl. 528-79.000.

Brody, Harry, to Imperial Chemical Industries Limited. Melt spinning process. 4,442,057, Cl. 264-176.00F.

Brody, Harry, to Imperial Chemical Industries Limited. Melt spinning of polypropylene. 4,442,266, Cl. 525-173.000.

Brokaw, Kim C. Portable waste agitator. 4,441,824, Cl. 366-266.000.

Bron, Jose. Safety lock. 4,441,236, Cl. 292-336.300.

Brooks, Herbert; and Waite, Frederick A., to Imperial Chemical Industries PLC. Production of copolymers using shortstop agent at end of polymerization. 4,442,272, Cl. 526-82.000.

Brophy, John, to Cos Cob Research Associates. Device for use with the intake manifold of an internal combustion engine. 4,441,470, Cl. 123-306.000.

Brown, Arthur K., to Bendix Corporation, The. Brake booster. 4,441,319, Cl. 60-548.000.

Brown Boveri Electric Inc.: *See*—
Gray, Keith I.; and Meier, Henry G., 4,442,329, Cl. 200-148.00B.

Brown, George L.; and Spencer, Arthur T., to SCM Corporation. Aqueous coating composition comprising self-emulsifiable ester of epoxy and acid containing addition polymer. 4,442,246, Cl. 523-404.000.

Brown, Lawrence G. Exercising apparatus. 4,441,705, Cl. 272-73.000.
Brown, Timothy M.: *See*—
Hartman, Seymour; and Brown, Timothy M., 4,441,954, Cl. 156-291.000.
Brown, Wade R.; and Gumble, Thomas N., to Eaton Corporation. Appliance control valve assembly with opposite magnetic polarity solenoid coils. 4,441,521, Cl. 137-613.000.
Brunswick Corporation: *See*—
Boda, James C., 4,441,836, Cl. 403-154.000.
Hogan, Mark J.; and Cooke, Ernest R., 4,441,518, Cl. 135-98.000.
Kuester, Frank E., 4,442,162, Cl. 428-245.000.
Bruso, Frederick G.; Walker, Frank H.; and Lyon, Harry H., to General Motors Corporation. Hydraulic fluid reservoir system. 4,441,520, Cl. 137-44.000.
Bryington, Clayton W., II. Separable tool. 4,441,747, Cl. 294-51.000.
BS&B Safety Systems, Inc.: *See*—
Short, Edward H., III; Allen, Jerome D.; and Wood, Loren E., deceased, 4,441,350, Cl. 72-55.000.
BTR Limited: *See*—
Pickering, John; Woodhouse, Ian; and Ganendran, Araspillai N., 4,442,053, Cl. 264-36.000.
Buan, Danilo P.; and Navok, Ezra, to Pitney Bowes. Envelope ejection mechanism for a mailing machine. 4,441,420, Cl. 101-69.000.
Buchanan, William T. Spectrograph providing spectral reference marks. 4,441,814, Cl. 356-305.000.
Bucher, Robert R., to Jakob Muller Forschungs- und Finanz AG. Ribbon loom or the like. 4,441,530, Cl. 139-432.000.
Budd Company, The: *See*—
Hulse, David O., 4,441,539, Cl. 152-417.000.
Budinski, John A., to General Motors Corporation. Hybrid mechanical and electrical drive and engine cooling fan arrangement. 4,441,462, Cl. 123-41.110.
Buehrig, Gordon M., to Kughn, Richard P. Automobile rear end construction. 4,441,752, Cl. 296-1.00S.
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., to Vectra International Corporation. Thermographic cholesteric coating compositions and plates. 4,441,508, Cl. 128-736.000.
Buisson, Pierre: *See*—
Mercier, Georges; Mercier, Jacques; and Buisson, Pierre, 4,441,396, Cl. 83-871.000.
Buljan, Sergej-Tomislav: *See*—
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,441,894, Cl. 51-295.000.
Bullano, Gerald A.: *See*—
Neiditch, David S.; Bullano, Gerald A.; DiLullo, Robert J.; and Ofstein, David E., 4,442,273, Cl. 526-88.000.
Bunnell Plastics, Inc.: *See*—
Curran, Donald G.; and Anderson, Robert A., 4,441,694, Cl. 264-163.000.
Burba, John L., III: *See*—
Lee, John M.; Baumen, William C.; Wolcott, Richard A.; and Burba, John L., III, 4,442,230, Cl. 521-28.000.
Burchfield, James E.; and Green, Robert C., to Exxon Research and Engineering Co. Process for supplying the heat requirement of a retort for recovering oil from solids by partial indirect heating of in situ combustion gases, and combustion air, without the use of supplemental fuel. 4,441,985, Cl. 208-11.00R.
Bureau de Recherches Geologiques et Minieres: *See*—
Baubron, Jean-Claude C., 4,442,353, Cl. 250-281.000.
Burge, Theodor; and Bracher, Gustav, to Sika AG, vorm. Kaspar Winkler & Co. Method of protecting reinforcing bars, pre-stressing cables and similar articles inside of structures. 4,442,021, Cl. 252-389.00R.
Burke, Thomas M.: *See*—
Bich, George J.; Burke, Thomas M.; and Smith, James D. B., 4,442,138, Cl. 427-116.000.
Burkhart, George M.; and Dohnalik, Martin F., to Barber-Greene Co. Apparatus for increasing the delivery range of a mixing and delivery auger trough. 4,441,821, Cl. 366-61.000.
Burnley, William S., III: *See*—
Price, Abner B.; and Burnley, William S., III, 4,441,429, Cl. 102-526.000.
Burns, Christopher D.; Obrascovs, Guntis; and Pipe, Andrew L. Athletic shoe with ankle support strap. 4,441,265, Cl. 36-117.000.
Burroughs Corporation: *See*—
Roesner, Bruce B., 4,442,507, Cl. 365-100.000.
Busboom, Garry W., to Allis-Chalmers Corporation. Combined air intake screen and access door for combine. 4,441,512, Cl. 130-27.00Z.
Buschulte, Winfried: *See*—
Wagner, Ulrich; and Buschulte, Winfried, 4,441,879, Cl. 431-284.000.
Buswell, Richard G.: *See*—
Watson, Kenneth; Buswell, Richard G.; and Saunders, James E., 4,441,384, Cl. 74-665.0GA.
Butts, Michael L.: *See*—
Peterson, Donny L.; and Butts, Michael L., 4,441,697, Cl. 266-170.000.
Buzinski, Robert W., to Amsted Industries Incorporated. Helical coil spring end forming. 4,441,696, Cl. 266-57.000.
Byerly, Robert M., to TA Mfg., Inc. Clamp device. 4,441,677, Cl. 248-74.00B.
C.G.V. S.a.S. di Claudio Castiglioni & C.: *See*—
Castiglioni, Claudio, 4,441,346, Cl. 70-312.000.
C. L. Frost & Son, Inc.: *See*—
Rood, William R., 4,441,601, Cl. 193-37.000.
C. Uyemura & Co., Ltd.: *See*—
Matsumura, Sowjun; Araki, Ken; Otaka, Tetsuo; and Tanigawa, Masumi, 4,441,965, Cl. 204-16.000.
C.V. Chemie Combinatie Amsterdam C.C.A.: *See*—
Kim, Jong C., 4,442,132, Cl. 426-549.000.
Cabot Corporation: *See*—
Getz, Marlyn F.; Maggio, Michael J.; and Hitch, Billy F., 4,441,927, Cl. 75-229.000.
Cadtrak Corporation: *See*—
Sukonick, Josef, 4,442,495, Cl. 364-521.000.
Calcavecchio, Peter: *See*—
Drake, Evelyn N.; and Calcavecchio, Peter, 4,442,241, Cl. 523-130.000.
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, to International Flavors & Fragrances Inc. Use of 4-methyl-3-cyclohexene-1-carboxylic acid for augmenting or enhancing the aroma of fabric softener compositions or drier-added articles. 4,442,012, Cl. 252-8.600.
Caldwell, David H.; and Hurley, Robert M., to GTE Products Corporation. Lamp package. 4,441,650, Cl. 229-39.00B.
Caldwell, Donald L., to Dow Chemical Company, The. Substituted cobalt oxide spinels for catalytic decomposition of hypochlorite. 4,442,227, Cl. 502-243.000.
Caldwell, Edward N., to Dalen Products, Inc. Shelf mounting system, parts therefor and method of making the same. 4,441,433, Cl. 108-152.000.
Calet, Rudolph J. Post assembly. 4,441,679, Cl. 248-156.000.
California Institute of Technology: *See*—
Jamieson, Robert S., 4,442,401, Cl. 323-351.000.
Camelot Industries Corporation: *See*—
Lobdell, Alban J., 4,441,795, Cl. 351-169.000.
Campbell, John S.: *See*—
Reeder, Dennis J.; Campbell, John S.; Kasunic, Keith J.; and Laiterman, Lee H., 4,442,524, Cl. 372-107.000.
Canales, Manuel J.; and Reynolds, John, to Stauffer Chemical Company. Method of desulfurizing waste gases containing sulfur dioxide. 4,442,083, Cl. 423-567.00R.
Canalizo, Carlos R. Well production apparatus and method. 4,441,861, Cl. 417-54.000.
Canfield, Sheldon A.: *See*—
Daws, John W.; Bradley, Hugh W., Jr.; and Canfield, Sheldon A., 4,441,367, Cl. 73-597.000.
Cannon, John P., to Plattner Industries, Inc. Cooler having freeze bottle insert. 4,441,336, Cl. 62-457.000.
Canon Kabushiki Kaisha: *See*—
Fukui, Masahisa; and Ito, Yoshio, 4,442,459, Cl. 358-286.000.
Katayama, Masahiro; Yoshida, Nobutoshi; and Kuge, Tsukasa, 4,441,417, Cl. 100-176.000.
Kimura, Takashi, 4,442,462, Cl. 360-33.100.
Kitajima, Tadayuki; and Kasama, Nobuhiro, 4,442,190, Cl. 430-53.000.
Kosugi, Masao, 4,441,853, Cl. 414-757.000.
Mashimo, Yukio; and Iwashita, Tomonori, 4,441,801, Cl. 354-173.110.
Tateoka, Masamichi, 4,441,792, Cl. 350-415.000.
Cantatore, Giuseppe, to Chimosa Chimica Organica S.p.A. Piperidyl derivatives of macrocyclic triazine compounds, possessing a stabilizing activity for polymers, and processes for their preparation. 4,442,250, Cl. 524-98.000.
Cape Boards & Panels Limited: *See*—
McQueen, George; and Barrable, Victor E., 4,441,293, Cl. 52-377.000.
Caprara, Giuseppe: *See*—
Gozzo, Franco; Caprara, Giuseppe; Roberti, Lamberto; Paparatto, Giuseppe; and Santoro, Ettore, 4,442,301, Cl. 560-124.000.
Caray, Andre, to Valeo. Diaphragm clutch cover assemblies. 4,441,600, Cl. 192-89.00B.
Carbon Gas Technologie GmbH: *See*—
Schuster, Ernst, 4,441,892, Cl. 48-197.00R.
Cardellini, Claudio B. Loose leaf binder. 4,441,834, Cl. 402-55.000.
Cardio-Pace Medical, Inc.: *See*—
Nordling, Neal F., 4,441,498, Cl. 128-419.00P.
Nordling, Neal F., 4,441,498, Cl. 128-419.00P.
Carl Freudenberg, Firma: *See*—
Lohmar, Ernst; and Wenneis, Wolffried, 4,442,233, Cl. 521-98.000.
Carless, John E.: *See*—
Rowe, James S.; and Carless, John E., 4,442,051, Cl. 264-4.300.
Carlson, David E.; and Williams, Brown F., to RCA Corporation. Photodetector having enhanced back reflection. 4,442,310, Cl. 136-256.000.
Carlson, Norman R.; Roesner, Raymond E.; and Lanuke, Edward W., to Dresser Industries, Inc. Method and apparatus for measurement of fluid density and flow rates in multi-phase flow regimes. 4,441,361, Cl. 73-155.000.
Carlson, Norman R., to Dresser Industries, Inc. Method for determining volumetric fractions and flow rates of individual phases within a multi-phase flow regime. 4,441,362, Cl. 73-155.000.
Carlton, Charles D., to Tiffany Industries, Inc. Tilting table. 4,441,432, Cl. 108-5.000.
Carman, Vincent E.; Anderson, David H.; and Lucas, Eugene F., to Advanced Energy Systems Inc. Fuel-efficient energy storage automotive drive system. 4,441,573, Cl. 180-165.000.
Carney, John L., Jr.; and Gilbert, Richard L., to ACF Industries, Incorporated. Railway hatch cover and strap safety tab latching assembly. 4,441,431, Cl. 105-377.000.

Carter, Walter S., to British Aerospace Public Limited Company. Magneto-optical phase-modulating devices. 4,442,414, Cl. 332-7.510.

Carter, William A.; and Martin, Frank A., to Inland Steel Company. Electrotreating apparatus with electrode roll. 4,441,975, Cl. 204-206.000.

Cason, George A., Jr., to Dresser Industries, Inc. Sealed bearing rotary rock bit assembly. 4,441,244, Cl. 29-434.000.

Castiglioni, Claudio, to C.G.V. S.a.S. di Claudio Castiglioni & C. Combination lock with a single knob both for controlling the opening and for changing the lock combination. 4,441,346, Cl. 70-312.000.

Castillo, Michael S. Portable variable angle drilling machine. 4,441,564, Cl. 175-122.000.

Cato, Craig J.: *See*—
Wiggins, Richard H.; Doddington, George; and Cato, Craig J., 4,441,399, Cl. 84-470.00R.

Causby, Barry D.: *See*—
Lees, Gerard D.; and Causby, Barry D., 4,442,249, Cl. 523-455.000.

Cavalcante, Mario, to Ivalda S.p.A. Container for the storage and withdrawal of ear cleaning sticks or similar articles. 4,441,610, Cl. 206-361.000.

Caves, Thomas J. Hair trimming devices. 4,441,252, Cl. 30-30.000.

Centro Ricerche Fiat S.p.A.: *See*—
Iemmi, Giuliano; Raimondo, Michele; and Mo, Luigi, 4,441,976, Cl. 204-224.00M.

Cerati, Celestin: *See*—
Aglae, Gilbert R.; Alavoine, Jacques J.; Contensou, Claude; Rousseau, Jacques R.; and Cerati, Celestin, 4,441,672, Cl. 244-110.00C.

Chadwick, Duane G.: *See*—
Hill, Geoffrey E.; Woffinden, Duard S.; and Chadwick, Duane G., 4,441,363, Cl. 73-170.00R.

Champion International Corporation: *See*—
Hain, Paul O.; and Lepisto, J. George, 4,441,613, Cl. 206-621.000.
Hartman, Seymour; and Brown, Timothy M., 4,441,954, Cl. 156-291.000.

Chance, Britton. NMR System for determining relationship between work output and oxidative phosphorylation capability in an exercising body member. 4,441,502, Cl. 128-653.000.

Chance Manufacturing, Inc.: *See*—
Goepner, Siegfried E., 4,441,515, Cl. 133-5.00R.

Charles Stark Draper Laboratory, Inc., The: *See*—
Kumar, Kaplesh; and Das, Dilip K., 4,441,874, Cl. 425-78.000.

Charnock, Ronald S., to Loctite (Ireland) Limited. Heat resistant toughened adhesive composition. 4,442,267, Cl. 525-309.000.

Chart, John E., to Teledyne Penn-Union. One-piece, composite electrical connector. 4,442,182, Cl. 428-654.000.

Chase, A. Timothy, to Struthers Wells Corporation. Cross-over bundle for heat exchanger. 4,441,550, Cl. 165-145.000.

Chebra, Ronald J.: *See*—
James, Rolland T.; and Chebra, Ronald J., 4,442,320, Cl. 179-5.00R.

Chemical Engineering Technology, Inc.: *See*—
Foster, David I.; Scott, Paul T.; Pierick, Mark W.; and Shaddock, Clarence L., Jr., 4,442,077, Cl. 423-210.000.

Chemische Werke Huels, AG: *See*—
Weiss, Jorn-Volker; Riemer, Heinz; and Mutzberg, Friedhelm, 4,442,245, Cl. 523-401.000.

Chen, Chin H.; Young, Ralph H.; and Scozzafava, Michael, to Eastman Kodak Company. Photoconductive compositions and elements containing naphthalene bis-dicarboximide compounds. 4,442,193, Cl. 430-83.000.

Chen, Juh W.: *See*—
Muchmore, Charles B.; Chen, Juh W.; and Tempelmeyer, Kenneth E., 4,441,886, Cl. 44-15.00R.

Chen, Richard M. Golf ball including alignment markings and golf ball marking device. 4,441,716, Cl. 273-183.00C.

Chernyshev, Alexandr N.: *See*—
Oshkin, Anatoly I.; Banov, Mikhail D.; and Chernyshev, Alexandr N., 4,442,312, Cl. 174-15.0WF.

Chester, Arthur W.; and Stover, William A., to Mobil Oil Corporation. Catalyst and catalyst support compositions. 4,442,223, Cl. 502-68.000.

Chevron Research Company: *See*—
Bishop, Keith C., III; Earls, David E.; Robinson, Richard C.; Blakely, Donald W., deceased; and Jacobson, Robert L., administrator, 4,442,221, Cl. 502-25.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,442,074, Cl. 423-54.000.

Chiang, Ping-Wang, to Amdahl Corporation. System for specifying critical dimensions, sequence numbers and revision levels on integrated circuit photomasks. 4,442,188, Cl. 430-5.000.

Chiba, Mio: *See*—
Kotani, Shintaro; Abiko, Ichimatsu; Arae, Takashi; Chiba, Mio; Araki, Tomoo; and Kanno, Hiromasa, 4,442,429, Cl. 340-786.000.

Chikaraishi, Takayo, to Nissan Motor Co., Ltd. Window regulating device for a window glass of a vehicle door or the like. 4,441,276, Cl. 49-352.000.

Childs, Robert H. E., Jr.; Klebanoff, Jack L.; and Pollack, Frederick J., to Intel Corporation. Microprocessor memory management and protection mechanism. 4,442,484, Cl. 364-200.000.

Chimosa Chimica Organica S.p.A.: *See*—
Cantatore, Giuseppe, 4,442,250, Cl. 524-98.000.

Chiu Technical Corporation: *See*—
Fleck, William C., 4,442,382, Cl. 315-287.000.

Christensen, Joergen A.: *See*—
Lassen, Joergen B.; Skrumsager, Birte K.; and Christensen, Joergen A., 4,442,113, Cl. 424-267.000.

Christinger, Werner, to Becton Dickinson and Company. Multiple sampling device having molded valve and hub. 4,441,951, Cl. 156-245.000.

Chu, Ta-Shing; and England, Robert W., to Bell Telephone Laboratories, Incorporated. Small dual frequency band, dual-mode feedhorn. 4,442,437, Cl. 343-786.000.

Ciba-Geigy Corporation: *See*—
Abel, Heinz; and Schafer, Paul, 4,441,885, Cl. 8-603.000.
Bentz, Rolf; and Schori, Christian, 4,441,896, Cl. 55-85.000.
Kunz, Walter; Eckhardt, Wolfgang; Hubele, Adolf; and Riebli, Peter, 4,442,117, Cl. 424-273.00R.

Cieslak, Leonard K.: *See*—
Cieslak, Stanley; and Cieslak, Leonard K., 4,441,483, Cl. 126-206.000.

Cieslak, Stanley; and Cieslak, Leonard K. Portable furnace for wearing apparel. 4,441,483, Cl. 126-206.000.

Cipelletti, Alberto. Ice-cream machine. 4,441,334, Cl. 62-258.000.

Citizen Watch Co., Ltd.: *See*—
Morokawa, Shigeru, 4,441,825, Cl. 368-204.000.
Morokawa, Shigeru; and Koga, Keiichiro, 4,441,826, Cl. 368-204.000.

Claassen, Karl-Heinz: *See*—
Oelsch, Jurgen; Volk, Richard; and Claassen, Karl-Heinz, 4,442,055, Cl. 264-105.000.

Clarion Co., Ltd: *See*—
Kurihara, Masaki, 4,441,577, Cl. 181-147.000.

Clark, Kenneth R.: *See*—
Kahn, Alan R.; Clark, Kenneth R.; and Bahr, Dennis E., 4,441,357, Cl. 73-40.000.

Clark, Michael T.; and Gilmore, Ian J., to Shell Oil Company. Herbicidal heterocyclic pentalenes. 4,441,911, Cl. 71-91.000.

Clarkson, Joseph, to Thatchcode Limited. Office cabinet. 4,441,768, Cl. 312-257.0SM.

Claudet, Gerard: *See*—
Bon-Mardion, Gilbert; Claudet, Gerard; and Lacaze, Albert, 4,441,325, Cl. 62-3.000.

Clitherow, John W.; Bradshaw, John; Mackinnon, John W. M.; Price, Barry J.; Martin-Smith, Michael; and Judd, Duncan B., to Glaxo Group Limited. 1H-1,2,4-Triazole-3,5-diamine derivatives and use as selective histamine H_2-antagonists. 4,442,110, Cl. 424-263.000.

Cloud, Nathan; Marin, Robert A.; and McErlane, James E., to Du Pont de Nemours, E. I., and Company. Apparatus for automatically doffing yarn packages and donning empty bobbins on a winder. 4,441,660, Cl. 242-35.50A.

Clough, Douglas O.: *See*—
Parker, Alan; and Clough, Douglas O., 4,441,310, Cl. 37-401.000.

Cluff, David W.: *See*—
Cluff, Warren S.; and Cluff, David W., 4,441,739, Cl. 281-16.000.

Cluff, Warren S.; and Cluff, David W. Booklet. 4,441,739, Cl. 281-16.000.

Coast Catamaran Corporation: *See*—
Alter, Hobart L.; Wake, Lewis F.; and Platten, Myron G., 4,441,447, Cl. 114-167.000.

Coca-Cola Company, The: *See*—
Credle, William S., Jr., 4,441,684, Cl. 248-674.000.

Cockshott, Charles P.; and Evans, Kenneth S., to Lucas Industries Limited. Gas flow meters. 4,441,371, Cl. 73-861.090.

Coderre, Andre. Travelling surface temperature probe. 4,441,827, Cl. 374-153.000.

Cohen, Stanley N.: *See*—
Michaels, Alan S.; Robertson, Channing R.; Cohen, Stanley N.; Inloes, Douglas S.; and Smith, William J., 4,442,206, Cl. 435-68.000.

Colgate-Palmolive Company: *See*—
Fraikin, Marie-Helene; and Dillarstone, Alan, 4,442,013, Cl. 252-8.800.

Colley, Rowan H., to Rolls-Royce Limited. Combustion equipment for a gas turbine engine including a fuel burner capable of accurate positioning and installation as a unit in a flame tube. 4,441,323, Cl. 60-737.000.

Collins Company, Ltd.: *See*—
Liou, Tony; and Wang, Richard, 4,441,756, Cl. 297-39.000.

Collins, David J.: *See*—
Griffin, David A.; and Collins, David J., 4,441,917, Cl. 71-103.000.

Colman, Geoffrey; and Russell, Roy R. B., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Social Services in Her Britannic Majesty's Government of the. Protection against dental caries. 4,442,085, Cl. 424-49.000.

Columbia Helicopters, Inc.: *See*—
Reber, Dwight E., 4,441,750, Cl. 294-83.00R.

Comau S.p.A.: *See*—
Rosa, Cristiano, 4,442,335, Cl. 219-79.000.

Commissariat a l'Energie Atomique: *See*—
Bon-Mardion, Gilbert; Claudet, Gerard; and Lacaze, Albert, 4,441,325, Cl. 62-3.000.

Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme): *See*—
Mollier, Jean H.; and Ugon, Michel, 4,442,345, Cl. 235-380.000.

Comparetto, John E.; and Glaser, Paul R. Dynamic orthotic platform. 4,441,499, Cl. 128-595.000.

Compen, Johannes M. A. A.: *See*—
Van Der Waal, Jan; and Compen, Johannes M. A. A., 4,442,376, Cl. 313-402.000.

Compur-Electronic GmbH: *See*—
Heuschmann, Herr F.; and Plank, Herr A., 4,442,426, Cl. 340-539.000.

Conoco Inc.: *See*—
Yoon, Heeyoung; and Rutledge, Gerald D., 4,441,461, Cl. 123-3.000.
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Mancini, Derek V., 4,441,618, Cl. 211-49.00D.
Contensou, Claude: *See*—
Aglae, Gilbert R.; Alavoine, Jacques J.; Contensou, Claude; Rousseau, Jacques R.; and Cerati, Celestin, 4,441,672, Cl. 244-110.00C.
Continental Group, Inc., The: *See*—
Harry, Ieuan L., 4,441,878, Cl. 425-534.000.
Supik, Helmuth, 4,441,699, Cl. 266-255.000.
Cooke, Ernest R.: *See*—
Hogan, Mark J.; and Cooke, Ernest R., 4,441,518, Cl. 135-98.000.
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Fischer, William H.; Cookson, Alan H.; and Yoon, Kue H., 4,442,311, Cl. 174-14.00R.
Cooper, Gary: *See*—
Genuit, James E.; and Cooper, Gary, 4,442,343, Cl. 219-433.000.
Cooper, Hugh E. Foldable tillage implement. 4,441,562, Cl. 172-311.000.
Cooper Industries, Inc.: *See*—
Lichtenberger, Rosemary K., 4,441,787, Cl. 350-96.230.
Cooper, Richard K.: *See*—
Brau, Charles A.; Kurnit, Norman A.; and Cooper, Richard K., 4,442,522, Cl. 372-2.000.
Corboy, Edward D., Jr. Tool for retrieving out-of-reach objects. 4,441,746, Cl. 294-19.00R.
Corning Glass Works: *See*—
Amos, Lynn G.; and Rogers, Charles H., 4,442,218, Cl. 436-525.000.
Flannery, James E.; Shoup, Robert D.; and Wexell, Dale R., 4,442,175, Cl. 428-404.000.
Malmendier, Joseph W.; Pride, Carol F.; Rhoads, Randy L.; Schlaufman, Robert J.; and Shoup, Robert D., 4,441,905, Cl. 65-21.300.
Melezoglu, Cevdet; and Smith, David J., 4,441,811, Cl. 356-128.000.
Cos Cob Research Associates: *See*—
Brophy, John, 4,441,470, Cl. 123-306.000.
Cosden Technology, Inc.: *See*—
Abernathy, Marshall; and Bailey, Darrell E., 4,442,048, Cl. 261-114.00R.
Cossart, Alain M., to Metalex. Element for tunnel-type metal shuttering. 4,441,838, Cl. 405-150.000.
Costa, Maurizio D. Machine for forming croissants and the like confectionery products. 4,441,408, Cl. 99-450.200.
Cotton, Incorporated: *See*—
Underbrink, Gary L.; Wilkes, Lambert H.; and Jones, Joseph K., 4,441,232, Cl. 19-48.00R.
Council for Mineral Technology: *See*—
Curr, Thomas R.; and Barcza, Nicholas A., 4,441,921, Cl. 75-10.00R.
Courtaulds PLC: *See*—
Betts, Max W.; and Robinson, Frank, 4,441,338, Cl. 66-64.000.
Covey, George H., III, to Presray Corporation, The. Mounting for endless sealing strips. 4,441,278, Cl. 49-477.000.
Cowan, William S.; and Galle, Edward M., Jr., to Armco Inc. Connectors for securing members together under large clamping force. 4,441,740, Cl. 285-18.000.
Cozean, Charles H., Jr. Intraocular lenses. 4,441,217, Cl. 3-13.000.
CPG Products Corp.: *See*—
Cummings, Charles A.; and La Dow, William R., 4,441,256, Cl. 33-27.00L.
Craft, Richard A.: *See*—
Smith, Edwin B.; and Craft, Richard A., 4,442,412, Cl. 331-1.000.
Craw, Carol S.: *See*—
Craw, Craig A.; and Craw, Carol S., 4,441,639, Cl. 224-237.000.
Craw, Craig A.; and Craw, Carol S. Quick-release and quick-deploy container for emergency equipment. 4,441,639, Cl. 224-237.000.
Creative Tool Company: *See*—
Dooley, Daniel J.; and Williamson, Warren L., 4,441,360, Cl. 73-119.00A.
Credle, William S., Jr., to Coca-Cola Company, The. Pump mounting bracket. 4,441,684, Cl. 248-674.000.
Cremer, Gerard: *See*—
Beeley, Nigel R. A.; Cremer, Gerard; Dimsdale, Michael J.; and Manoury, Philippe, 4,442,126, Cl. 424-324.000.
Crepin, Roger, to Brandt Armements. Guided projectile. 4,441,670, Cl. 244-3.220.
Cresta Technology Limited: *See*—
Morris, Peter A., 4,442,002, Cl. 210-411.000.
Crivello, James V.; and Lee, Julia L., to General Electric Company. Photocurable compositions. 4,442,197, Cl. 430-280.000.
Crone, John M., Jr., to Texaco Inc. Catalyst and method of making the same. 4,442,024, Cl. 502-334.000.
Crott, Kurt: *See*—
Wetzels, Walter; Crott, Kurt; and Voell, Erich, 4,441,280, Cl. 51-103.00R.
Crowell, Christopher S.; and Dennison, Warren, to Structural Graphics, Inc. Staggered flip-page display folder. 4,441,270, Cl. 40-534.000.
Crowley, Patrick J., to Beecham Group Limited. Pharmaceutical compositions. 4,441,609, Cl. 206-204.000.
Crown Metal Manufacturing Company: *See*—
Varon, David S.; and Siegal, Burton L., 4,441,300, Cl. 52-732.000.
Cummings, Charles A.; and La Dow, William R., to CPG Products Corp. Manipulator for creating a multiplicity of varied line designs. 4,441,256, Cl. 33-27.00L.
Cummins Engine Company, Inc.: *See*—
McCutchen, Norman L., 4,441,643, Cl. 227-110.000.
Peters, Lester L., 4,441,654, Cl. 239-89.000.
Cuneo, Giuseppe, to Black & Decker Inc. Switch-plug module for portable electric tool. 4,442,366, Cl. 310-50.000.
Curr, Thomas R.; and Barcza, Nicholas A., to Council for Mineral Technology; and Middelburg Steel and Alloys (Proprietary) Limited. Production and treatment of ferrochromium. 4,441,921, Cl. 75-10.00R.
Curran, Donald G.; and Anderson, Robert A., to Bunnell Plastics, Inc. Method of manufacturing a safety shield for flanged pipe couplings. 4,441,694, Cl. 264-163.000.
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Williams, David M.; and Curtis, Charles L., 4,441,790, Cl. 350-302.000.
Custom-Bilt Machinery, Inc.: *See*—
Faltin, Hans G., 4,441,703, Cl. 271-243.000.
Custom Stamping Mfg. Co.: *See*—
Werner, Linda B.; and Werner, William A., 4,441,214, Cl. 2-174.000.
D.E.P. Systems, Inc.: *See*—
Pohl, Herbert A., 4,441,972, Cl. 204-180.00R.
Dahl, Byron M., to Esco, Inc. Sign frame. 4,441,269, Cl. 40-156.000.
Dai Ichi High Frequency Company, Ltd.: *See*—
Watanabe, Yasuo, 4,442,331, Cl. 219-10.430.
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Takeuchi, Hideo; Horiguchi, Satoru; and Tamaki, Ryuzo, 4,441,819, Cl. 356-380.000.
Daicel Chemical Industries, Ltd.: *See*—
Toba, Hirotaka; Itoh, Masanori; Nakano, Keita; Wakoh, Shoji; Toyoshima, Toshihiko; and Todo, Hidemasa, 4,442,160, Cl. 428-215.000.
Daido Metal Company, Ltd.: *See*—
Mori, Sanae, 4,441,240, Cl. 29-156.50A.
Daikyo Gomu Seiko, Ltd.: *See*—
Matukura, Yoshiharu; and Sudo, Denpei, 4,441,621, Cl. 215-247.000.
Dailey, Leo L., to Fischer & Porter Company. Nutating probe for gas analysis. 4,441,979, Cl. 204-402.000.
Daimler-Benz Aktiengesellschaft: *See*—
Bernauer, Otto; Holzt, Hans-Peter; and Lenz, Hermann, 4,441,326, Cl. 62-7.000.
Dainippon Pharmaceutical Co., Ltd.: *See*—
Ichikawshi, Hitoshi; Tanaka, Terukazu; and Imasato, Yu, 4,442,101, Cl. 424-250.000.
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Oshima, Hiroyo; Daisaku, Matsukuma; Yutaka, Kojima; Yukio, Kobayashi; and Koichi, Nagai, 4,442,172, Cl. 428-342.000.
d'Alayer de Costemore d'Arc, Stephane M., to Allsop, Inc. Cassette cleaning device. 4,442,468, Cl. 360-128.000.
Dalen Products, Inc.: *See*—
Caldwell, Edward N., 4,441,433, Cl. 108-152.000.
Damm, Horst; and Pfordt, Hartwig, to Mannesmann AG. Connecting a hub to the drive of a traction chain vehicle, or the like. 4,441,570, Cl. 180-9.620.
Damm, Sverre. Steering device for many-axled goose-neck trailers. 4,441,730, Cl. 280-426.000.
Dane, Lambertus M.; Engels, Johannes C. A.; and Stevens, Cornelis L., to Stamicarbon BV. Process for continously monitoring and controlling the product film quality from a polymer production unit. 4,442,054, Cl. 264-40.100.
Danfoss A/S: *See*—
Beierholm, Hans M.; and Henriksen, Niels J., 4,442,394, Cl. 318-807.000.
Daniel, Joseph T., to Halliburton Company. Temperature stabilized amplifier for borehole use. 4,442,410, Cl. 330-289.000.
Daniel, Roy M.: *See*—
Morgan, Hugh W.; and Daniel, Roy M., 4,442,214, Cl. 435-253.000.
Daniel, Sam: *See*—
Myers, Michael H.; and Daniel, Sam, 4,442,433, Cl. 343-378.000.
d'Argembeau, Etienne Y. Brushes and the manufacture thereof. 4,441,227, Cl. 15-167.00R.
Das, Dilip K.: *See*—
Kumar, Kaplesh; and Das, Dilip K., 4,441,874, Cl. 425-78.000.
Datapoint Corporation: *See*—
Friend, George E.; Meyers, John D.; and Van Dyke, Steve, 4,442,502, Cl. 364-900.000.
Daugherty, Carol A.; Siebens, Larry N.; and Daugherty, Ronald R., to R. D. Design Co., Inc. Cosmetic and therapeutic appliance. 4,441,487, Cl. 128-24.200.
Daugherty, Ronald R.: *See*—
Daugherty, Carol A.; Siebens, Larry N.; and Daugherty, Ronald R., 4,441,487, Cl. 128-24.200.
Davies, Roy V., to Boots Company Limited, The. 3-Methylthiomethyl- and 3-methylsulfinylmethyl-4-quinolinones useful for treating hypertension. 4,442,109, Cl. 424-258.000.
Davis, James W., to Mead Corporation, The. Document exposure apparatus. 4,441,806, Cl. 355-23.000.
Davis, Kenneth W. Feedback system for a linear actuator. 4,442,390, Cl. 318-663.000.

Davis, Kent L., to WesTech Engineering, Inc. Rotary vacuum filter. 4,442,001, Cl. 210-402.000.

Davis, Ronald P., to Interlock Industries Limited. Pivot joints. 4,441,835, Cl. 403-24.000.

Dawley, Robert E. Temperature control system. 4,441,329, Cl. 62-126.000.

Daws, John W.; Bradley, Hugh W., Jr.; and Canfield, Sheldon A., to Owens-Corning Fiberglas Corporation. Apparatus for determining fabric tension. 4,441,367, Cl. 73-597.000.

DBS, Inc.: *See*—
Tipple, Neil A.; Gibson, Jerome W.; and Boyd, Ronald J., 4,441,831, Cl. 400-134.300.

Deal, Bruce E.: *See*—
Lehrer, William I.; and Deal, Bruce E., 4,442,449, Cl. 357-67.000.

Dean, Mark E.; Kummer, David A.; and Saenz, Jesus A., to International Business Machines Corporation. Composite video color signal generation from digital color signals. 4,442,428, Cl. 340-703.000.

Deans, David R., to Imperial Chemical Industries PLC. Sample injection. 4,442,217, Cl. 436-161.000.

de Bode, Ronus: *See*—
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Trijzelaar, Hans B.; de Bode, Ronus; and Welle, Hendricus B. A., 4,442,107, Cl. 424-258.000.

Deere & Company: *See*—
Hutchison, Wayne R.; and Apple, David L., 4,441,735, Cl. 280-771.000.
Johnson, Stanley J., 4,441,846, Cl. 414-335.000.
Kuhn, John B., 4,441,306, Cl. 56-15.900.
Westimayer, David A., 4,441,266, Cl. 37-244.000.

Degani, Joshua: *See*—
Besomi, Paul R.; Degani, Joshua; and Wilt, Daniel P., 4,442,402, Cl. 324-158.00D.

Degner, Dieter; and Hannebaum, Heinz, to BASF Aktiengesellschaft. Electrochemical preparation of 2,5-dialkoxy-2,5-dihydrofurans. 4,441,970, Cl. 204-59.00R.

Degussa Aktiengesellschaft: *See*—
Arntz, Dietrich; Prescher, Gunter; and Heilos, Johannes, 4,442,308, Cl. 568-480.000.
Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, 4,441,930, Cl. 134-2.000.
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Panster, Peter; and Kleinschmit, Peter, 4,442,040, Cl. 260-429.00R.

de Jong, Joannes N. M.; and Earle, Richard L., to Sperry Corporation. Capacitive pressure transducer. 4,442,474, Cl. 361-283.000.

DeLuca, Raymond F., to Georgia-Pacific Corporation. Cut web material dispenser with web centering and tension control. 4,441,392, Cl. 83-337.000.

DelVecchio, William D.: *See*—
Isgur, Irving E.; and DelVecchio, William D., 4,442,259, Cl. 524-839.000.

Dennison, Warren: *See*—
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D'Errico, Michael J.: *See*—
Engelhart, John E.; Angeles, Marshall R.; and D'Errico, Michael J., 4,442,122, Cl. 424-304.000.

de Saint Georges-Gridelet, Daniele: *See*—
Lebrun, Philippe; and de Saint Georges-Gridelet, Daniele, 4,442,091, Cl. 424-181.000.

Desrochers, Franklin J. Portable bi-directional data communication terminal. 4,442,318, Cl. 179-2.00C.

Dessau, Ralph M.; and Haag, Werner O., to Mobil Oil Corporation. Process for the production of fermentation ethanol. 4,442,210, Cl. 435-161.000.

Detection Systems, Inc.: *See*—
Lederer, David B., 4,442,359, Cl. 250-342.000.

Dettelbach, Alfred; and Henzler, Roland, to Reich Spezialmaschinen GmbH. Apparatus for melting and applying a meltable adhesive. 4,441,450, Cl. 118-681.000.

Deutsche Babcock Werke Aktiengesellschaft: *See*—
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Deutsche Forschungs-und Versuchsanstalt fur Lufl- und Raumfahrt E.V.: *See*—
Lindner, Friedrich; and Scheunemann, Kurt, 4,442,016, Cl. 252-70.000.
Wagner, Ulrich; and Buschulte, Winfried, 4,441,879, Cl. 431-284.000.

Development Finance Corporation of New Zealand: *See*—
Morgan, Hugh W.; and Daniel, Roy M., 4,442,214, Cl. 435-253.000.

DeVries, Charles R.: *See*—
Bowman, Clyde L.; DeVries, Charles R.; and Saur, Charles W., 4,441,607, Cl. 198-781.000.

De Weck, Roger. Self-righting multihull boat. 4,441,445, Cl. 114-39.000.

Dewhurst, John E.: *See*—
Taylor, Ronald P.; Dewhurst, John E.; and Abouzahr, Saad M., 4,442,235, Cl. 521-122.000.

Dey, Philip, to BICC Public Limited Company. Overhead electric transmission systems. 4,442,364, Cl. 307-147.000.

Dezawa, Shin-ichiro; Akashi, Goro; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,442,159, Cl. 428-212.000.

Diamond Shamrock Chemicals Company: *See*—
Marcellis, Alphonso W.; Johnson, Grannis S.; and Fleming, Joseph P., 4,441,929, Cl. 106-90.000.

Dibowski, Gunter; and Grommes, Helmut, to Deutsche Babcock Werke Aktiengesellschaft. Seal of a mill. 4,441,720, Cl. 277-3.000.

Diehl GmbH & Co.: *See*—
Wich, Harald, 4,441,669, Cl. 244-3.130.

Dietrich, Wolfgang: *See*—
Neumann, Kurt; and Dietrich, Wolfgang, 4,442,174, Cl. 428-376.000.

Diffracto Ltd.: *See*—
Pryor, Timothy R., 4,441,817, Cl. 356-375.000.

Dill, Terry A., to Jefferson Industries Company. Hydraulic fan control. 4,441,651, Cl. 236-49.000.

Dillarstone, Alan: *See*—
Fraikin, Marie-Helene; and Dillarstone, Alan, 4,442,013, Cl. 252-8.800.

DiLullo, Robert J.: *See*—
Neiditch, David S.; Bullano, Gerald A.; DiLullo, Robert J.; and Ofstein, David E., 4,442,273, Cl. 526-88.000.

Di Matteo, Paul; and Ross, Joseph, to Robotic Vision Systems, Inc. Controlling positioning systems upon removal of power. 4,441,854, Cl. 414-787.000.

Dimsdale, Michael J.: *See*—
Beeley, Nigel R. A.; Cremer, Gerard; Dimsdale, Michael J.; and Manoury, Philippe, 4,442,126, Cl. 424-324.000.

Distler, James A. Food package of plastic laminate. 4,442,158, Cl. 428-195.000.

Diversified Electronics, Inc.: *See*—
Voss, Earl W., 4,442,406, Cl. 328-134.000.

Dixon Automatic Tool, Inc.: *See*—
Dixon, Paul H., 4,441,852, Cl. 414-733.000.

Dixon, Paul H., to Dixon Automatic Tool, Inc. Parts handling machine. 4,441,852, Cl. 414-733.000.

Dizmang, Michael J. Apparatus for hoisting loads to elevated building locations. 4,441,849, Cl. 414-490.000.

Do-Mehanotehnika, Proizvodnja in Prodaja Igrac, Kovinskih in Plasticnih Izdelkov N.Sol.O.: *See*—
Hrovatin, Albert; and Brezec, Joze, 4,441,443, Cl. 112-258.000.

Dr. Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,442,111, Cl. 424-263.000.

Doddington, George: *See*—
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Doherty, William G.: *See*—
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Dohnalik, Martin F.: *See*—
Burkhart, George M.; and Dohnalik, Martin F., 4,441,821, Cl. 366-61.000.

Don Fell Limited: *See*—
Takeuchi, Seiji, 4,441,627, Cl. 220-461.000.

Donat, William F.: *See*—
Schroeder, Edward A.; and Donat, William F., 4,441,709, Cl. 273-1.50R.

Donelly, James R.; Felsvang, Karsten S.; Morsing, Per; and Veltman, Preston L., to A/S Niro Atomizer. Process for removal of nitrogen oxides and sulfur oxides from waste gases. 4,442,079, Cl. 423-239.000.

Donnelly, James R.; Felsvang, Karsten S.; Morsing, Per; and Veltman, Preston L., to A/S Niro Atomizer. Fluid bed SOX/NOX process—"-hydrated calcine absorption". 4,442,080, Cl. 423-239.000.

Donzis, Byron A., to Houston Protective Equipment, Inc. Protective batting jacket. 4,441,211, Cl. 2-2.000.

Dooley, Daniel J.; and Williamson, Warren L., to Creative Tool Company. Engine timing instrument. 4,441,360, Cl. 73-119.00A.

Dooley, James L.: *See*—
Latter, Albert L.; Hammond, R. Philip; and Dooley, James L., 4,442,065, Cl. 376-280.000.

Dorpmund, Willi, to Graaff Kommanditgesellschaft. Mounting for a tank receptacle in a supporting framework. 4,441,678, Cl. 248-146.000.

Dose, Ludwig; and Dose, Werner. Tanning apparatus. 4,441,342, Cl. 69-30.000.

Dose, Werner: *See*—
Dose, Ludwig; and Dose, Werner, 4,441,342, Cl. 69-30.000.

Doss, Albert S. Pelt stretcher. 4,441,267, Cl. 38-102.800.

Douwenga, Rudolf, to Lockwood International B.V. Apparatus for opening out the filling openings of bags of foil material or the like which are connected together in the manner of a band. 4,441,304, Cl. 53-568.000.

Dow Chemical Company, The: *See*—
Caldwell, Donald L., 4,442,227, Cl. 502-243.000.
Lee, John M.; Baumen, William C.; Wolcott, Richard A.; and Burba, John L., III, 4,442,230, Cl. 521-28.000.

Downhole Services, Inc.: *See*—
Zublin, Casper W., 4,441,557, Cl. 166-312.000.

Downhower, Francis H., Jr.; and Finlayson, Paul T., to United States of America, Energy. Protective circuit for thyristor controlled systems and thyristor converter embodying such protective circuit. 4,442,480, Cl. 363-57.000.

Drake, Evelyn N.; and Calcavecchio, Peter, to Exxon Research and Engineering Co. Shear thickening composition. 4,442,241, Cl. 523-130.000.

Dreeben, Lionel. Capillary stencil printer with improved replenishment of the printing pad and re-inking of the reservoir. 4,441,422, Cl. 101-125.000.

Dresser Industries, Inc.: *See*—
Carlson, Norman R.; Roesner, Raymond E.; and Lanuke, Edward W., 4,441,361, Cl. 73-155.000.
Carlson, Norman R., 4,441,362, Cl. 73-155.000.
Cason, George A., Jr., 4,441,244, Cl. 29-434.000.
Wilke, Charles F., 4,441,469, Cl. 123-295.000.

Drzewiecki, George: *See*—
Young, Charles E.; and Drzewiecki, George, 4,441,897, Cl. 55-112.000.

Dubar, Kenneth W.; and Onofrio, Armadio J. Wrist and ring finger support for bowler. 4,441,711, Cl. 273-54.00B.

Ducellier & Cie: *See*—
Veyssiere, Gerard, 4,442,370, Cl. 310-239.000.

Dudley, James R.; and Gorham, Barry J. Method and apparatus for determining position. 4,441,809, Cl. 356-1.000.

Dudley, Russell D., to Reclamet, Inc. Chunk separator and process of separation for machine tool scrap. 4,441,995, Cl. 209-137.000.

Duerksen, Charles J.; and Rodriquez, Benjamin P., to Stauffer Chemical Company. Dichloroacetyl oxazolidine herbicide antidotes. 4,441,914, Cl. 71-95.000.

Duke, Charles B.: *See*—
McDonagh, Andrew J.; and Duke, Charles B., 4,441,352, Cl. 72-249.000.

Dullis, Gerhard: *See*—
Johannes, Gerhard; Shroff, Fali; Dullis, Gerhard; and Steidl, Dieter, 4,442,244, Cl. 523-221.000.

Dumazy, Christian: *See*—
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Dummermuth, Ernst H.; Galdun, Daniel J.; Grudowski, Raymond A.; and Stewart, Daniel L., to Allen-Bradley Company. Modular programmable controller. 4,442,504, Cl. 364-900.000.

Dumortier, Thierry M.: *See*—
Van Dyck, Francis S.; and Dumortier, Thierry M., 4,441,713, Cl. 273-73.00F.

Dung, Herbert: *See*—
Zolner, Dieter H.; Rittmann, Friedrich; Dung, Herbert; Haremsa, Johannes; Bauer, Georg; Otto, Josef; Muhlenbeck, Josef; and Lauterbach-Dammler, Inge, 4,442,525, Cl. 373-93.000.

Dunn, William: *See*—
Knapp, William; Dunn, William; and Smith, Kent F., 4,442,508, Cl. 365-104.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bither, Tom A., Jr., 4,442,226, Cl. 502-209.000.
Briggs, Anglis R., 4,442,212, Cl. 435-188.000.
Cloud, Nathan; Marin, Robert A.; and McErlane, James E., 4,441,660, Cl. 242-35.50A.
Foederer, Wilhelmus T. M.; and Voorn, Francesco G. M., 4,441,779, Cl. 339-99.00R.
Kirayoglu, Birol; and Zafiroglu, Dimitri P., 4,442,161, Cl. 428-219.000.
Larsen, Howland A., 4,442,260, Cl. 524-845.000.
Miller, Lester I., 4,442,256, Cl. 524-539.000.
Shapiro, Rafael, 4,441,910, Cl. 71-90.000.
Sommerfeld, Eugene G.; and Stamegna, Andrew P., 4,442,269, Cl. 525-440.000.

Durcan, John W. Load carrying apparatus. 4,441,727, Cl. 280-62.000.

Duwel, Edward C.: *See*—
Eckert, Alton B., Jr.; and Duwel, Edward C., 4,442,501, Cl. 364-900.000.

Dvornik, Dushan M.; and Simard-Duquesne, Nicole, to Ayerst, McKenna & Harrison, Inc. Aldose reductase inhibition by 1-(4-chlorobenzoyl)-5-methoxy-2-methyl-1H-indole-3-acetic acid. 4,442,118, Cl. 424-274.000.

Dwarakanath, Mirmira R.: *See*—
Ahuja, Bhupendra K.; and Dwarakanath, Mirmira R., 4,442,529, Cl. 375-34.000.

Dwyer, Francis G.; and Garwood, William E., to Mobil Oil Corporation. Catalytic dewaxing of oils containing ammonia over highly siliceous porous crystalline materials of the zeolite ZSM-5 type. 4,441,991, Cl. 208-111.000.

Dzus Fastener Co., Inc.: *See*—
Wright, Andrew C. W.; and Petruschke, John W., 4,441,843, Cl. 411-349.000.

E. J. Brooks Company: *See*—
Swift, Allan W., 4,441,233, Cl. 24-16.0PB.

E. R. Squibb & Sons, Inc.: *See*—
Horovitz, Zola P., 4,442,089, Cl. 424-177.000.

E-Z Products, Inc.: *See*—
Storm, Nelson; and Storm, Gregory A. (said Nelson Storm assors. to), 4,441,279, Cl. 51-69.000.

Earle, Richard L.: *See*—
de Jong, Joannes N. M.; and Earle, Richard L., 4,442,474, Cl. 361-283.000.

Earls, David E.: *See*—
Bishop, Keith C., III; Earls, David E.; Robinson, Richard C.; Blakely, Donald W., deceased; and Jacobson, Robert L., administrator, 4,442,221, Cl. 502-25.000.

Eastman Kodak Company: *See*—
Chen, Chin H.; Young, Ralph H.; and Scozzafava, Michael, 4,442,193, Cl. 430-83.000.
Kingsley, Richard T.; and Sherman, Larry, 4,441,612, Cl. 206-620.000.
Passmore, David T.; Wooten, Willis C.; and McBride, Paul, 4,442,270. Cl. 525-440.000.
Powell, Philip G., 4,442,454, Cl. 358-167.000.
Welch, Richard D.; and Mulder, John G., 4,441,663, Cl. 242-65.000.

Eaton Corporation: *See*—
Brown, Wade R.; and Gumble, Thomas N., 4,441,521, Cl. 137-613.000.

Ebel, Mark S.: *See*—
Priel, Ury; Yaron, Giora; and Ebel, Mark S., 4,442,510, Cl. 365-218.000.

Echte, Adolf: *See*—
Brandstetter, Franz; Hambrecht, Juergen; Stephan, Rudolf; Overhoff, Heinz-Juergen; Schwaab, Josef; Bernhard, Claus; Swoboda, Johann; and Echte, Adolf, 4,442,263, Cl. 525-83.000.

Eckert, Alton B., Jr.; and Duwel, Edward C., to Pitney Bowes Inc. Electronic postage meter with weak memory indication. 4,442,501, Cl. 364-900.000.

Eckhardt, Wolfgang: *See*—
Kunz, Walter; Eckhardt, Wolfgang; Hubele, Adolf; and Riebli, Peter, 4,442,117, Cl. 424-273.00R.

Edmonston, William H. Carburetor. 4,442,046, Cl. 261-44.00B.

Edwards, Keith F.: *See*—
Edwards, Raymond A.; and Edwards, Keith F., 4,441,505, Cl. 128-726.000.

Edwards, Raymond A.; and Edwards, Keith F., to Kinetics Measurement Corp. Sensing device for human lung exhalation/inhalation air flow measurement. 4,441,505, Cl. 128-726.000.

Edwards, William B., III, to Philip Morris Incorporated. Optically active nicotine analogs and process for their preparation. 4,442,292, Cl. 546-281.000.

Eibner, Jules A., to Sperry Corporation. Passive fiber optic keyboard. 4,442,425, Cl. 340-365.00S.

El Paso Products Company: *See*—
Mims, Samuel S., 4,442,303, Cl. 560-191.000.

Elchinger, Gilbert M., to Xerox Corporation. Ink jet gutter method and apparatus. 4,442,440, Cl. 346-1.100.

Electric Power Development Co. Ltd.: *See*—
Nakabayashi, Yasuyuki; Matsura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,441,260, Cl. 34-15.000.

Electricity Council, The: *See*—
Jackson, William B.; Harvey, Ian G.; and Warren, Philip H., 4,442,332, Cl. 219-10.670.

Electrolux Constructor Aktiebolag: *See*—
Forsberg, Klas Y., 4,441,617, Cl. 211-1.500.

Elek, Louis F.; and Frost, Albert C., to Union Carbide Corporation. Enhanced carbon monoxide utilization in methanation process. 4,441,893, Cl. 48-197.00R.

Elektro-Optik GmbH & Co. KG: *See*—
Menke, Josef F., 4,441,668, Cl. 244-3.110.

Elkins, Carlos D. Microscopic evaluation slide. 4,441,793, Cl. 350-536.000.

Elter, Claus: *See*—
Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Fritz, Rolf; and Kissel, Karl-Friedrich, 4,442,066, Cl. 376-302.000.

Emhart Industries, Inc.: *See*—
Andrejasich, Raymond J.; and Perry, Ralph A., 4,442,405, Cl. 324-439.000.
Wagle, William F., 4,442,326, Cl. 200-38.00R.

Emmer, Ivan; Hajek, Zdenek; and Repa, Petr, to Matematicko-fyzikalni fakulta University Karlovy v Praze. Method of manufacture of an electric humidity detecting sensing element. 4,441,968, Cl. 204-35.00N.

Emmett, James R., to Northern Engineering Industries plc. Regeneration of ion exchange materials. 4,442,229, Cl. 521-26.000.

Empie, Howard L., Jr., to International Paper Company. Recovery of heat and chemical values from spent pulping liquors. 4,441,959, Cl. 162-30.100.

Endfield, Cyril, to Microwriter Limited. Portable word-processor. 4,442,506, Cl. 364-900.000.

Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, to Nissan Motor Company, Limited. Ignition system for a multi-cylinder internal combustion engine of a vehicle. 4,441,479, Cl. 123-605.000.

Endo, Keiji: *See*—
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, 4,442,027, Cl. 252-574.000.

Endo, Toshiaki; and Yoshiyuki, Kazuhiko, to Nissan Motor Co., Ltd. Window molding for automobile. 4,441,755, Cl. 296-93.000.

Endoh, Masakazu, to Mitsubishi Denki Kabushiki Kaisha. Heat pump type airconditioner. 4,441,901, Cl. 62-160.000.

Engel, John F., to FMC Corporation. 4-Heterocyclic-substituted-2-indanyl alcohols and insecticidal ester derivatives. 4,442,296, Cl. 548-563.000.

Engelhart, John E.; Angeles, Marshall R.; and D'Errico, Michael J., to Merck & Co., Inc. 1,2-Dibromo-2-cyanoalkane antimicrobial compounds. 4,442,122, Cl. 424-304.000.

Engels, Johannes C. A.: *See*—
Dane, Lambertus M.; Engels, Johannes C. A.; and Stevens, Cornelis L., 4,442,054, Cl. 264-40.100.

Engineered Roof Trusses Pty. Ltd.: *See*—
Muir, William, 4,441,287, Cl. 52-93.000.

England, Robert W.: *See*—
Chu, Ta-Shing; and England, Robert W., 4,442,437, Cl. 343-786.000.

Enomoto, Fujio, to Olympus Optical Co., Ltd. Camera with a lens protective cover. 4,441,799, Cl. 354-145.100.

Enste, Klemens; and Giessmann, Sigrun, to Enste, Klemens. Child support wedge. 4,441,221, Cl. 5-431.000.

Environmental Research Institute: *See—*
Sternberg, Stanley R.; and Lougheed, Robert M., 4,442,543, Cl. 382-49.000.

Enzmann, Michael H., to Allis-Chalmers Corporation. Harvester header with floating cutter bar. 4,441,307, Cl. 56-208.000.

Epsom, Robert L.; Gailus, Paul H.; and van den Heuvel, Anthony P., to Motorola, Inc. Variable impedance synthesis apparatus. 4,442,416, Cl. 333-263.000.

Epstein, Harry. Lavatory accessory. 4,441,219, Cl. 4-448.000.

Ericsson, Axel B. R., to Profoment Utvecklings AB. Floor. 4,441,292, Cl. 52-309.700.

Ermer, Wolfgang: *See—*
Bartel, Siegfried; Ermer, Wolfgang; and Payrhammer, Bernd, 4,441,667, Cl. 242-197.000.

Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, to Hoechst Aktiengesellschaft. Process for purifying and recovering contaminated catalyst solution obtained in the carbonylation of methyl acetate and/or dimethylether. 4,442,304, Cl. 560-232.000.

Esco, Inc.: *See—*
Dahl, Byron M., 4,441,269, Cl. 40-156.000.

Escort Systems, Inc.: *See—*
Starkweather, Robert G., 4,441,851, Cl. 414-563.000.

Estech, Inc.: *See—*
Rehberg, Bobby E., 4,441,918, Cl. 71-113.000.

Estel Hoogovens B.V.: *See—*
Beentjes, Nicolaas H.; and Gootjes, Peter, 4,441,701, Cl. 266-287.000.
Middel, Jan; and Steenkamp, Gezinus A., 4,441,935, Cl. 148-9.500.

Estes, John H.: *See—*
Smolin, William; and Estes, John H., 4,442,222, Cl. 502-60.000.

Etablissements Briand S.A.: *See—*
Baumard, Ulysse, 4,441,603, Cl. 198-518.000.

Ethicon, Inc.: *See—*
Shalaby, Shalaby W.; and Koelmel, Donald F., 4,441,496, Cl. 128-335.500.

Ette, Aniedi O.: *See—*
Robinson, Douglas J.; and Ette, Aniedi O., 4,442,073, Cl. 423-54.000.

Evans, Alvin S., Sr. Pressure relief valve system for penile implant device. 4,441,491, Cl. 128-79.000.

Evans, David M.; and Weightman, Barry O., to National Research Development Corporation. Orthopaedic splints. 4,441,489, Cl. 128-77.000.

Evans, Kenneth S.: *See—*
Cockshott, Charles P.; and Evans, Kenneth S., 4,441,371, Cl. 73-861.090.

Evans, Robert W.; and Montgomery, James W., to Hughes Tool Company. Retrievable well packer. 4,441,559, Cl. 166-382.000.

Everett, Richard C., to Kool-Stop International Inc. Bicycle brake assembly. 4,441,592, Cl. 188-264.00A.

Everlite A/A: *See—*
Sokoler, Henryk; and Evers, Poul H., 4,441,291, Cl. 52-309.100.

Evers, Poul H.: *See—*
Sokoler, Henryk; and Evers, Poul H., 4,441,291, Cl. 52-309.100.

Ex-Cell-O Corporation: *See—*
Hobson, James C., 4,441,401, Cl. 89-37.00F.

Exxon Research & Engineering Company: *See—*
Broadhurst, Thomas E., 4,441,987, Cl. 208-33.000.
Burchfield, James E.; and Green, Robert C., 4,441,985, Cl. 208-11.00R.
Drake, Evelyn N.; and Calcavecchio, Peter, 4,442,241, Cl. 523-130.000.
Feldman, Nicholas, 4,441,890, Cl. 44-51.000.
Guerre, Robert P., 4,441,984, Cl. 208-11.01E.
Looney, James R.; and McDougall, Lee A., 4,442,014, Cl. 252-8.55C.
Lundberg, Robert D.; Thaler, Warren A.; and Agarwal, Pawan K., 4,442,253, Cl. 524-211.000.
Martner, John G., 4,442,443, Cl. 346-140.00R.
Thaler, Warren A.; Walker, Thad O.; Lundberg, Robert D.; and Wagensommer, Joseph, 4,442,011, Cl. 252-8.50M.

Exxon Reserch and Engineering Co.: *See—*
Langer, Arthur W., Jr., 4,442,309, Cl. 585-523.000.

Ezoe, Mitsuhiko, to Nissan Motor Company, Limited. Method and apparatus for inspecting vehicles. 4,441,359, Cl. 73-117.000.

Ezure, Kazuya: *See—*
Saito, Takao; and Ezure, Kazuya, 4,442,181, Cl. 428-623.000.

F.lli Pagnoni S.p.A.: *See—*
Pagnoni, Giorgio, 4,441,877, Cl. 425-338.000.

Fabrique Nationale Herstal: *See—*
Van Dyck, Francis S.; and Dumortier, Thierry M., 4,441,713, Cl. 273-73.00J.

Facilitated Separations, Inc.: *See—*
Hill, William E.; and McAuliffe, Charles A., 4,442,297, Cl. 549-206.000.

Fairchild Camera & Instrument Corporation: *See—*
Herndon, William H., 4,442,509, Cl. 365-154.000.
Lehrer, William I.; and Deal, Bruce E., 4,442,449, Cl. 357-67.000.

Faltin, Hans G., to Custom-Bilt Machinery, Inc. Press delivery system with precision product timing and alignment. 4,441,703, Cl. 271-243.000.

Fan, John C. C., to Massachusetts Institute of Technology. Cermet film selective-black absorber. 4,442,166, Cl. 428-323.000.

Farian, Gerhard, to Karl M. Reich Maschinenfabrik GmbH. Buffer system for fastener driving devices. 4,441,644, Cl. 227-130.000.

Fauck, Gerhard; and Kiel, Bernd-Joachim, to WABCO Fahrzeugbremsen GmbH. Variable load controlled fluid brake pressure regulator. 4,441,763, Cl. 303-23.00R.

Fauss, Rudolf; Sonntag, Michael; Wagner, Kuno; Findeisen, Kurt; and Mennicken, Gerhard, to Bayer Aktiengesellschaft. Compositions containing isocyanatosilanes as additives to increase the stability in storage of compositions containing polyurethane prepolymers with free isocyanate groups. 4,442,279, Cl. 528-44.000.

Favstritsky, Nicolai A.: *See—*
Griffith, Ronald L.; and Favstritsky, Nicolai A., 4,442,058, Cl. 264-176.00R.

Fedde, George A.: *See—*
Lin, Ta-Tung, deceased; Lin, Meei H., Executrix; and Fedde, George A., 4,442,542, Cl. 382-8.000.

Federal-Mogul Corporation: *See—*
Pichler, Gerald P., 4,441,722, Cl. 277-134.000.

Feist, Wieland, to Jenoptik Jena GmbH. Method and apparatus for automatic alignment of an angle-measuring instrument. 4,441,812, Cl. 356-147.000.

Feldman, Gilbert J.; and Feldman, Richard A., to Allied Surveyor Supplies Mfg. Company. Break-away sectionalized driven rod. 4,441,288, Cl. 52-103.000.

Feldman, Nicholas, to Exxon Research and Engineering Co. Method for improving stability of residual fuel oils. 4,441,890, Cl. 44-51.000.

Feldman, Richard A.: *See—*
Feldman, Gilbert J.; and Feldman, Richard A., 4,441,288, Cl. 52-103.000.

Felix, Arthur M.; Ishitsuka, Hideo; Meienhofer, Johannes A.; and Ohta, Yumiko, to Hoffmann-La Roche Inc. Immunopotentiating peptides. 4,442,031, Cl. 260-112.50R.

Felsvang, Karsten S.: *See—*
Donelly, James R.; Felsvang, Karsten S.; Morsing, Per; and Veltman, Preston L., 4,442,079, Cl. 423-239.000.
Donnelly, James R.; Felsvang, Karsten S.; Morsing, Per; and Veltman, Preston L., 4,442,080, Cl. 423-239.000.

Ferrara, Frank. Shoeshining machine and method of supporting shoe during shining. 4,441,225, Cl. 15-34.000.

Ferrara, John M.: *See—*
Matt, Joseph; and Ferrara, John M., 4,441,888, Cl. 44-51.000.

Ferris Manufacturing Corp.: *See—*
Sessions, Robert W.; Jeslis, Jerome; and Rodzen, Richard A., 4,441,500, Cl. 128-641.000.

Fiber Industries, Inc.: *See—*
Griffith, Ronald L.; and Favstritsky, Nicolai A., 4,442,058, Cl. 264-176.00R.
Lees, Gerard D.; and Causby, Barry D., 4,442,249, Cl. 523-455.000.

Fichtel & Sachs AG: *See—*
Axthammer, Ludwig, 4,441,593, Cl. 188-322.110.

Fichtner, Hans, to Mistral Windsurfing AG. Improvements in windsurfing boards. 4,441,446, Cl. 114-39.000.

Fidelity Grafcor, Inc.: *See—*
Hall, Robert E., 4,441,626, Cl. 220-443.000.

Fiedler, Helmut; and Ritter, Ernst, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,441,868, Cl. 417-490.000.

Field, Roger C. Adjustable sun screen for camera lens. 4,441,794, Cl. 350-580.000.

Fielding, Brian S.; and Leiper, Fred S., to Hardware Designers, Inc. Separable bottom mounted drawer slide. 4,441,772, Cl. 312-330.00R.

Fields, Buddy D.: *See—*
Fields, Rush F.; and Fields, Buddy D., 4,441,761, Cl. 299-64.000.

Fields, Larry D., to Yardney Electric Corporation. Liquid filtration system. 4,441,997, Cl. 210-266.000.

Fields, Rush F.; and Fields, Buddy D. Mining machine. 4,441,761, Cl. 299-64.000.

Findeisen, Kurt: *See—*
Fauss, Rudolf; Sonntag, Michael; Wagner, Kuno; Findeisen, Kurt; and Mennicken, Gerhard, 4,442,279, Cl. 528-44.000.

Finike Italiana Marposs S.p.A.: *See—*
Golinelli, Guido; and Selleri, Narciso, 4,441,257, Cl. 33-174.00L.

Finkel, Henry, to Stanbel Ltd. Core holder and dispenser. 4,441,642, Cl. 225-46.000.

Finkel, Joel R.; Freudenthal, William E.; and Stoides, John G., to GTE Laboratories Incorporated. Methods of and apparatus for sensing the denomination of paper currency. 4,442,541, Cl. 382-7.000.

Finlayson, Paul T.: *See—*
Downhower, Francis H., Jr.; and Finlayson, Paul T., 4,442,480, Cl. 363-57.000.

Firestone Tire & Rubber Company, The: *See—*
McDaniel, Charles R.; and Baumgardner, H. Richard, 4,441,258, Cl. 33-179.000.
Sekula, Paul J.; and Potts, Gerald R., 4,442,499, Cl. 364-574.000.

Fischer & Porter Company: *See—*
Dailey, Leo L., 4,441,979, Cl. 204-402.000.

Fischer, William H.; Cookson, Alan H.; and Yoon, Kue H., to United States of America, Energy. Particle trap to sheath contact for a gas-insulated transmission line having a corrugated outer conductor. 4,442,311, Cl. 174-14.00R.

Fischer, William H.; and Yoon, Kue H., to United States of America, Energy. Conductor load bearing roller for a gas-insulated transmission line having a corrugated outer conductor. 4,442,313, Cl. 174-28.000.

Fitton, David L., to United Technologies Corporation. Combined turbine power plant blade tip clearance and nacelle ventilation system. 4,441,314, Cl. 60-266.000.

Flannery, James E.; Shoup, Robert D.; and Wexell, Dale R., to Corning Glass Works. Cellular ceramic bodies and method making same. 4,442,175, Cl. 428-404.000.

Flax, Stephen W., to General Electric Company. Method and means for determining ultrasonic wave attenuation in tissue. 4,441,368, Cl. 73-599.000.

Fleck, William C., to Chiu Technical Corporation. Constant power switching power supply. 4,442,382, Cl. 315-287.000.

Fleischer, Willy; and von Schuckmann, Alfred, to Willy Fleischer Metalwarenfabrik GmbH & Co. KG; and von Schuckmann, Alfred. Adjustable foot support. 4,441,758, Cl. 297-439.000.

Fleming, Joseph P.: *See*—
Marcellis, Alphonso W.; Johnson, Grannis S.; and Fleming, Joseph P., 4,441,929, Cl. 106-90.000.

Fletcher, Robert P.; Stein, David M.; and Wladawsky-Berger, Irving, to International Business Machines Corporation. Three level memory hierarchy using write and share flags. 4,442,487, Cl. 364-200.000.

Flinn, John W.; Johnson, James D.; and Stiemert, Ward L., to Gafner Machine, Inc. Mobile log sawing and splitting machine. 4,441,535, Cl. 144-3.00K.

Flint, William T.: *See*—
Blanchard, Senior N.; Flint, William T.; Tibbetts, George C.; and Sawyer, Joseph A., 4,442,324, Cl. 179-111.00E.

Floating Point Systems, Inc.: *See*—
Hall, William E., 4,442,488, Cl. 364-200.000.

Fluor Corporation: *See*—
Howald, Frank P., 4,441,993, Cl. 209-5.000.

FMC Corporation: *See*—
Engel, John F., 4,442,296, Cl. 548-563.000.

Foederer, Wilhelmus T. M.; and Voorn, Francesco G. M., to Du Pont de Nemours, E. I., and Company. Contact device for a multiconductor cable. 4,441,779, Cl. 339-99.00R.

Foertsch, Johann; and Meltsch, Hans-Juergen, to Siemens Aktiengesellschaft. Longitudinally divided cable sleeve of shrinkable material having closure elements along its longitudinal edges. 4,442,155, Cl. 428-99.000.

Foga System Bygg AB: *See*—
Fridolfsson, Bengt E., 4,441,285, Cl. 52-73.000.

Fogelberg, Ernst R., to A.B. Bonnierforetagen. Process and composition for insulation of surfaces, and product thereby obtained. 4,442,242, Cl. 523-200.000.

Foote, Danny R.: *See*—
McMickle, Robert L.; and Foote, Danny R., 4,441,453, Cl. 119-3.000.

Ford, James M., to Olin Corporation. Electrolytic cell with sealing means. 4,441,977, Cl. 204-252.000.

Ford Motor Company: *See*—
Holubka, Joseph W., 4,442,146, Cl. 427-386.000.
Meitzler, Allen H., 4,442,515, Cl. 367-197.000.
Novak, Robert F., 4,442,420, Cl. 338-34.000.
Rest, Heinz; and Ufrecht, Martin, 4,441,463, Cl. 123-41.270.
Stojek, Dieter, 4,441,243, Cl. 29-433.000.

Ford, William C. L.: *See*—
Rathbone, Elner B.; Waites, Geoffrey M. H.; and Ford, William C. L., 4,442,123, Cl. 424-308.000.

Forney, Edgar W., Jr.; and Hogendobler, Richard S., to AMP Incorporated. Phase-matched semirigid coaxial cable and method for terminating the same. 4,441,781, Cl. 339-177.00R.

Forsberg, Klas Y., to Electrolux Constructor Aktiebolag. Storage structure comprising movable racks. 4,441,617, Cl. 211-1.500.

Forster, Karl-Heinz: *See*—
Naumann, Johannes; Pohl, Wolfgang; and Forster, Karl-Heinz, 4,441,424, Cl. 101-248.000.

Forster, Paul: *See*—
Mason, Stuart V., 4,441,753, Cl. 296-1.00S.

Fortsch, Johann; and Meltsch, Hans-Jurgen, to Siemens Aktiengesellschaft. Longitudinally split sleeve. 4,442,154, Cl. 428-99.000.

Foster, David I.; Scott, Paul T.; Pierick, Mark W.; and Shaddock, Clarence L., Jr., to Chemical Engineering Technology, Inc. Method of removing hydrides of phosphorus, arsenic, antimony and bismuth from hydrocarbon and non-hydrocarbon streams. 4,442,077, Cl. 423-210.000.

Foster Wheeler Energy Corporation: *See*—
Biswas, Bimal K.; and Kochie, Joseph E., 4,441,822, Cl. 366-101.000.

Fraikin, Marie-Helene; and Dillarstone, Alan, to Colgate-Palmolive Company. Concentrated fabric softening compositions. 4,442,013, Cl. 252-8.800.

Franke, Kurt: *See*—
Aichinger, Horst; and Franke, Kurt, 4,442,539, Cl. 378-207.000.

Franklin, James L.; and Watkins, Dale F., to Boeing Company, The. High heat transport capacity heat pipe. 4,441,548, Cl. 165-104.260.

Franklin, James L.; and Kramer, Ted J., to United States of America, Navy. Tapered seal for flow-through module. 4,442,475, Cl. 361-383.000.

Frensch, Heinz: *See*—
Albrecht, Konrad; Frensch, Heinz; and Schumacher, Hans, 4,441,919, Cl. 71-120.000.

Freudenthal, William E.: *See*—
Finkel, Joel R.; Freudenthal, William E.; and Stoides, John G., 4,442,541, Cl. 382-7.000.

Freund, Hans-Ulrich: *See*—
Konig, Rainer; Freund, Hans-Ulrich; Heide, Helga; and Sieglen, Rolf A., 4,441,616, Cl. 209-44.100.

Frey, Gunter: *See*—
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,442,033, Cl. 260-158.000.

Frey, Robert G.; and McVey, Charles I., to General Electric Company. High pressure sodium vapor lamp having resistance heater means. 4,442,378, Cl. 315-47.000.

Frey, Robert G.; and McVey, Charles I., to General Electric Company. High pressure sodium vapor lamp having resistance heater means. 4,442,379, Cl. 315-47.000.

Frick, Alfons: *See*—
Heckler, Hatto; Petersen, Godber; and Frick, Alfons, 4,441,390, Cl. 83-154.000.

Fridolfsson, Bengt E., to Foga System Bygg AB. Prefabricated balcony unit. 4,441,285, Cl. 52-73.000.

Friedrichs, Louis G., Jr.: *See*—
Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., 4,441,406, Cl. 99-275.000.

Friend, George E.; Meyers, John D.; and Van Dyke, Steve, to Datapoint Corporation. Digital information switching system. 4,442,502, Cl. 364-900.000.

Frisch, Kurt C., Jr.: *See*—
Kennedy, Joseph P.; and Frisch, Kurt C., Jr., 4,442,261, Cl. 525-324.000.

Fritz, Rolf: *See*—
Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Fritz, Rolf; and Kissel, Karl-Friedrich, 4,442,066, Cl. 376-302.000.

Fromson, Robert E.; and Shum, Lanson Y., to Westinghouse Electric Corp. Tool wear and tool failure monitor system. 4,442,494, Cl. 364-511.000.

Frost, Albert C.: *See*—
Elek, Louis F.; and Frost, Albert C., 4,441,893, Cl. 48-197.00R.

Frost, David G.: *See*—
Jalan, Vinod M.; and Frost, David G., 4,442,078, Cl. 423-230.000.

Fryklhult, Rune H., to AB Celleco. Strainer means for pulp purification. 4,441,999, Cl. 210-354.000.

Fuderer, Andrija, to Union Carbide Corporation. Catalytic steam reforming of hydrocarbons. 4,442,020, Cl. 252-373.000.

Fuji Kinzoku Kohsaku Co. Ltd.: *See*—
Mese, Hisayoshi, 4,441,524, Cl. 137-625.470.

Fuji Photo Film Co., Ltd.: *See*—
Asao, Yasuzi, 4,442,200, Cl. 430-538.000.
Dezawa, Shin-ichiro; Akashi, Goro; and Kitamoto, Tatsuji, 4,442,159, Cl. 428-212.000.
Igarashi, Akira; and Nakamura, Sukenori, 4,442,179, Cl. 428-220.000.
Mikami, Takeshi, 4,442,194, Cl. 430-137.000.
Sato, Masami; Akashi, Goro; Okuzawa, Yasutoshi; and Okutu, Toshimitu, 4,442,171, Cl. 428-336.000.

Fuji Photo Optical Co., Ltd.: *See*—
Numata, Saburo, 4,442,381, Cl. 315-151.000.

Fuji Xerox Co., Ltd.: *See*—
Kikuchi, Yoshiki; Omori, Takashi; Moriguchi, Haruhiko; Moriguchi, Fujio; and Murayama, Tomio, 4,442,441, Cl. 346-74.400.
Kurata, Masami; Moriguchi, Fujio; Ohmori, Takashi; and Makino, Katsuo, 4,442,452, Cl. 358-75.000.
Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Murayama, Tomio, 4,442,460, Cl. 358-296.000.
Toba, Hirotaka; Itoh, Hotaka; Itoh, Masanori; Nakano, Keita; Wakoh, Shoji; Toyoshima, Toshihiko; and Todo, Hidemasa, 4,442,160, Cl. 428-215.000.

Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for producing melt-blown thermoplastic articles. 4,442,062, Cl. 264-518.000.

Fujii, Takayoshi: *See*—
Maeda, Yuji; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,442,093, Cl. 424-236.000.

Fujikawa, Tsuneo: *See*—
Takagishi, Haruyoshi; Kamio, Kazuyoshi; and Fujikawa, Tsuneo, 4,441,645, Cl. 228-47.000.

Fujimoto, Takanori, to Mitsubishi Denki Kabushiki Kaisha. Contactless magneto ignition system. 4,441,478, Cl. 123-602.000.

Fujimoto, Teruo: *See*—
Shibayama, Kimio; Itaya, Kingo; and Fujimoto, Teruo, 4,442,199, Cl. 430-323.000.

Fujita, Tsutomu: *See*—
Iwata, Yoshio; Fujita, Tsutomu; Horiuchi, Tsunehisa; and Shimizu, Youichi, 4,442,456, Cl. 358-213.000.

Fujitsu Fanuc Limited: *See*—
Inaba, Hajimu; and Miyashita, Hideo, 4,442,521, Cl. 371-68.000.

Fujitsu Limited: *See*—
Narita, Masahisa; and Tomita, Osamu, 4,441,832, Cl. 400-144.200.
Osaka, Fukunobu, 4,442,444, Cl. 357-13.000.

Fukino Tadashi: *See*—
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; Fukino Tadashi; and Yoshida, Minoru, 4,442,360, Cl. 250-486.100.

Fukuda, Akira, to Sumitomo Electric Industries, Ltd. Pulse communication method and system using CMI to 3-level CMI conversion. 4,442,528, Cl. 375-20.000.

Fukuda Denshi Kabushiki Kaisha: *See*—
Segawa, Kiyoshi, 4,442,315, Cl. 174-36.000.

Fukui, Masahisa; and Ito, Yoshio, to Canon Kabushiki Kaisha. Facsimile transceiver. 4,442,459, Cl. 358-286.000.

Funabashi, Tadashi, to Universal Pioneer Corporation. Drive mechanism for disc player with bearing supported slider. 4,442,516, Cl. 369-43.000.

Funahashi, Takumi: *See—*
Yanabu, Satoru; Tamagawa, Tohoru; and Funahashi, Takumi, 4,442,469, Cl. 361-4.000.

Funakoshi, Satoshi: *See—*
Arakawa, Yoshio; Takanabe, Atsuyuki; Uemura, Yahiro; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,442,037, Cl. 260-397.200.

Funk, James E., to Alfred University Research Foundation Inc. Stabilized slurry and process for preparing same. 4,441,887, Cl. 44-51.000.

Furuno Electric Co., Ltd.: *See—*
Minohara, Kiyomi; and Abe, Atsushi, 4,441,375, Cl. 74-5.460.

Furuno, Yoshikuni: *See—*
Takahashi, Nobuyuki; Shibata, Masaaki; and Furuno, Yoshikuni, 4,441,936, Cl. 148-12.00C.

Furusawa, Hironobu: *See—*
Yusa, Haruhiko; Hoshino, Mitsuru; Kurosaki, Akira; Furusawa, Hironobu; and Sugitawa, Chikara, 4,442,262, Cl. 525-69.000.

G. D. Societa' per Azioni: *See—*
Seragnoli, Enzo, 4,441,662, Cl. 242-58.000.

GA Industries Inc.: *See—*
Salina, Louis E.; and Lescovich, Joseph E., 4,442,395, Cl. 320-48.000.

Gabbitas, Denbigh M.; and Shawyer, Peter J., to Molins Limited. Cigarette packaging machine control and monitoring system. 4,441,302, Cl. 53-52.000.

Gafner Machine, Inc.: *See—*
Flinn, John W.; Johnson, James D.; and Stiemert, Ward L., 4,441,535, Cl. 144-3.00K.

Gagliani, John; and Long, John V. Polyimide adhesive from lactam, aromatic dianhydride, aliphatic dianhydride and diamine. 4,442,283, Cl. 528-323.000.

Gailus, Paul H.: *See—*
Epsom, Robert L.; Gailus, Paul H.; and van den Heuvel, Anthony P., 4,442,416, Cl. 333-263.000.

Gaiser, Robert F., to Bendix Corporation, The. Fast-fill master cylinder. 4,441,320, Cl. 60-578.000.

Galdun, Daniel J.: *See—*
Dummermuth, Ernst H.; Galdun, Daniel J.; Grudowski, Raymond A.; and Stewart, Daniel L., 4,442,504, Cl. 364-900.000.

Gallagher, Paul H. Continuous laundering method. 4,441,882, Cl. 8-150.000.

Galle, Edward M., Jr., to Armco Inc. Connectors for securing members together under large clamping force. 4,441,741, Cl. 285-18.000.

Galle, Edward M., Jr.: *See—*
Cowan, William S.; and Galle, Edward M., Jr., 4,441,740, Cl. 285-18.000.

Gallios, George C., to Venus Scientific Inc. Dual output H.V. rectifier power supply driven by common transformer winding. 4,442,482, Cl. 363-61.000.

Ganendran, Araspillai N.: *See—*
Pickering, John; Woodhouse, Ian; and Ganendran, Araspillai N., 4,442,053, Cl. 264-36.000.

GAO Gesellschaft fur Automation und Organisation mbH.: *See—*
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,442,170, Cl. 428-333.000.

Garay, Oscar M.: *See—*
Siwiak, Kazimierz; Garay, Oscar M.; and Balzano, Quirino, 4,442,438, Cl. 343-792.000.

Gardner, Derek V.; and Gaster, Laramie M., to Beecham Group Limited. Pentacyclic derivatives of piperazine. 4,442,098, Cl. 424-248.510.

Garg, Diwakar, to Air Products and Chemicals, Inc. Zinc sulfide liquefaction catalyst. 4,441,983, Cl. 208-10.000.

Gargini, Paolo; Beinglass, Israel; and Ahlquist, Norman, to Intel Corporation. Method of making MOS device by forming self-aligned polysilicon and tungsten composite gate. 4,441,247, Cl. 29-571.000.

Garmong, Victor H. Method and apparatus for treating well formations. 4,441,561, Cl. 166-387.000.

Garrett Corporation, The: *See—*
Tippetts, Thomas B.; and Manion, Francis M., 4,441,525, Cl. 137-814.000.

Garthoff, Benward: *See—*
Meyer, Horst; Sitt, Rudiger; Thomas, Gunter; Garthoff, Benward; Towart, Robertson; and Rosentreter, Ulrich, 4,442,100, Cl. 424-250.000.

Garwood, William E.: *See—*
Dwyer, Francis G.; and Garwood, William E., 4,441,991, Cl. 208-111.000.

Gas Research Institute: *See—*
Wilkinson, William H., 4,441,332, Cl. 62-238.300.

Gasca Burges, Jesus. Structural joint for folding chair. 4,441,757, Cl. 297-55.000.

Gaster, Laramie M.: *See—*
Gardner, Derek V.; and Gaster, Laramie M., 4,442,098, Cl. 424-248.510.

Gazzoni, Domenico, to Sorema s.r.l. Drier, particularly for plastic material. 4,441,262, Cl. 34-57.00D.

Gebhardt, Joseph J.; and Juneau, Paul W., Jr., to General Electric Co. Low-density thermally insulating carbon-carbon syntactic foam composite. 4,442,165, Cl. 428-307.700.

Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik: *See—*
Rothamel, Karl, 4,441,355, Cl. 73-1.00R.

Gehring, Gerhard, to Siemens Aktiengesellschaft. Circuit for the load-proportional adjustment of the driving current of a single-ended output transistor of a transistor amplifier, operated in a common-emitter circuit. 4,442,411, Cl. 330-296.000.

Gehrmann, Klaus: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,442,304, Cl. 560-232.000.

General Connectors Corp.: *See—*
Greenwald, Fred A., 4,441,723, Cl. 277-164.000.

General Dynamics Corporation: *See—*
Olhausen, James N., Jr., 4,442,491, Cl. 364-454.000.

General Electric Company: *See—*
Alley, Robert P.; Relyea, John W.; and Sidebottom, Donald L., 4,441,545, Cl. 165-26.000.
Brezosky, Bernard J., 4,441,770, Cl. 312-276.000.
Crivello, James V.; and Lee, Julia L., 4,442,197, Cl. 430-280.000.
Flax, Stephen W., 4,441,368, Cl. 73-599.000.
Frey, Robert G.; and McVey, Charles I., 4,442,378, Cl. 315-47.000.
Frey, Robert G.; and McVey, Charles I., 4,442,379, Cl. 315-47.000.
Gebhardt, Joseph J.; and Juneau, Paul W., Jr., 4,442,165, Cl. 428-307.700.
Graham, Donald E., 4,442,169, Cl. 428-332.000.
Haaf, William R.; Lee, Gim F., Jr.; and Ting, Sei P., 4,442,251, Cl. 524-141.000.
Lessard, Dennis E.; and Sabourin, Paul F., 4,441,369, Cl. 73-602.000.
O'Donnell, Matthew, 4,441,503, Cl. 128-660.000.
Pfeifer, George F.; Koonce, George R.; and Phillips, Jack E., 4,442,351, Cl. 250-237.00G.
Snaddon, Robert W. L., 4,442,135, Cl. 427-31.000.

General Engineering & Manufacturing Corp.: *See—*
Haugk, Charles A., 4,441,381, Cl. 74-531.000.

General Instrument Corporation: *See—*
Knapp, William; Dunn, William; and Smith, Kent F., 4,442,508, Cl. 365-104.000.

General Motors Corporation: *See—*
Bouchard, Patrick M.; and King, Jack B., 4,441,475, Cl. 123-525.000.
Bruso, Frederick G.; Walker, Frank H.; and Lyon, Harry H., 4,441,520, Cl. 137-44.000.
Budinski, John A., 4,441,462, Cl. 123-41.110.
Powell, Thomas M., 4,441,467, Cl. 123-179.00G.
Symons, James D., 4,441,349, Cl. 72-53.000.

General Signal: *See—*
Newton, Ronald O., 4,441,764, Cl. 303-40.000.

General Tire & Rubber Company, The: *See—*
Sharma, Satish C., 4,441,946, Cl. 156-307.300.

Genuit, James E.; and Cooper, Gary, to Koffee Keeper, Inc. Adjustable cup and fluid heater. 4,442,343, Cl. 219-433.000.

Georgia-Pacific Corporation: *See—*
DeLuca, Raymond F., 4,441,392, Cl. 83-337.000.

Gerin, John: *See—*
Hamer, Dean H.; and Gerin, John, 4,442,205, Cl. 435-68.000.

Germaan, Albrecht J., to Koenig & Bauer Aktiengesellschaft. Collect-printing unit for security printing for use in a rotary printing press. 4,441,423, Cl. 101-175.000.

Getz, Marlyn F.; Maggio, Michael J.; and Hitch, Billy F., to Cabot Corporation. Tantalum powder composition. 4,441,927, Cl. 75-229.000.

Giacomelli, Thomas P., to TRE Semiconductor Equipment Corp. Focusing device for photo-exposure system. 4,441,808, Cl. 355-53.000.

Giants, Thomas W., to Hughes Aircraft Company. Ethynyl-substituted s-triazine derivatives, polymers thereof and process for making the same. 4,442,278, Cl. 526-261.000.

Gibitz, Ernest L. Tool holder combination. 4,441,619, Cl. 211-60.00T.

Gibson, David W. Bale handling apparatus. 4,441,845, Cl. 414-24.600.

Gibson, Jerome W.: *See—*
Tipple, Neil A.; Gibson, Jerome W.; and Boyd, Ronald J., 4,441,831, Cl. 400-134.300.

Giessmann, Sigrun: *See—*
Enste, Klemens; and Giessmann, Sigrun, 4,441,221, Cl. 5-431.000.

Gilbert, Richard L.: *See—*
Carney, John L., Jr.; and Gilbert, Richard L., 4,441,431, Cl. 105-377.000.

Giliard, David F.; and Yelf, Jack T., to MacMillan Bloedel Limited. Method and apparatus for constructing multiple layer corrugated board containers. 4,441,948, Cl. 156-189.000.

Gilmore, Ian J.: *See—*
Clark, Michael T.; and Gilmore, Ian J., 4,441,911, Cl. 71-91.000.

Gilson, Richard W.: *See—*
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Giordano Poultry-Plast S.p.A.: *See—*
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Giordano, Sebastiano, to Giordano Poultry-Plast S.p.A. Chick drinker apparatus with automatic water level control. 4,441,459, Cl. 119-72.000.

Giorgetti, Alberto, to Brembo S.p.A. Braking system for motor vehicle. 4,441,590, Cl. 188-195.000.

Gipson, Robert M.: *See—*
McCoy, David R.; Gipson, Robert M.; and Naylor, Carter G., 4,442,043, Cl. 260-513.00R.

Gist-Brocades N.V.: *See—*
Lebrun, Philippe; and de Saint Georges-Gridelet, Daniele, 4,442,091, Cl. 424-181.000.

Glaser, Paul R.: *See*—
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Glasstech, Inc.: *See*—
Nitschke, John S., 4,441,907, Cl. 65-106.000.
Glaxo Group Limited: *See*—
Clitherow, John W.; Bradshaw, John; Mackinnon, John W. M.; Price, Barry J.; Martin-Smith, Michael; and Judd, Duncan B., 4,442,110, Cl. 424-263.000.
Global Cathodic Protection Ltd.: *See*—
Warne, Michael A., 4,441,980, Cl. 204-409.000.
Goepner, Siegfried E., to Chance Manufacturing, Inc. Gaming device including coin dispensing means. 4,441,515, Cl. 133-5.00R.
Goldschmidt, Klaus: *See*—
Bassier, Friedrich; and Goldschmidt, Klaus, 4,441,840, Cl. 405-267.000.
Golinelli, Guido; and Selleri, Narciso, to Finike Italiana Marposs S.p.A. Probe for checking linear dimensions. 4,441,257, Cl. 33-174.00L.
Gomes, John M.: *See*—
Baglin, Elizabeth G.; and Gomes, John M., 4,442,072, Cl. 423-22.000.
Goodrich, D. Stephen. Stackable tray. 4,441,615, Cl. 206-511.000.
Gootjes, Peter: *See*—
Beentjes, Nicolaas H.; and Gootjes, Peter, 4,441,701, Cl. 266-287.000.
Goott, Joseph, to Tropic Industries, Inc. Poker-type table game. 4,441,714, Cl. 273-144.00B.
Gorbatenko, Igor V.: *See*—
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,441,549, Cl. 165-145.000.
Gordiski, Ronald J., to USM Corporation. Pulse cancellation circuitry. 4,441,281, Cl. 51-165.870.
Gorham, Barry J.: *See*—
Dudley, James R.; and Gorham, Barry J., 4,441,809, Cl. 356-1.000.
Goring, Hermann; Hentschel, Peter; and Meyl, Wolfgang, to Jenoptik Jena GmbH. Measuring system for alignment and measurement with an electronic tachymeter. 4,442,497, Cl. 364-561.000.
Gosset, Serge; and Huchett, Michael, to Roquette Freres. Quenching bath and quenching method for metals. 4,441,937, Cl. 148-18.000.
Goto, Kiyoshi: *See*—
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Gottsche, Reimer: *See*—
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Gozzo, Franco; Caprara, Giuseppe; Roberti, Lamberto; Paparatto, Giuseppe; and Santoro, Ettore, to Montedison S.p.A. Process for stereoselectively synthesizing cyclopropane carboxylates. 4,442,301, Cl. 560-124.000.
Graaff Kommanditgesellschaft: *See*—
Dorpmund, Willi, 4,441,678, Cl. 248-146.000.
Grabendike, Donald E.: *See*—
Grabendike, James F.; and Grabendike, Donald E., 4,441,296, Cl. 52-456.000.
Grabendike, James F.; and Grabendike, Donald E., to Sun-Dor-Co. Fire resistant wood door structure. 4,441,296, Cl. 52-456.000.
Graham, Donald E., to General Electric Company. Multiple coated cutting tool and method for producing same. 4,442,169, Cl. 428-332.000.
Graham, George W.; and McCally, Richard P., to Avon Products Inc. Chain severing apparatus and method. 4,441,389, Cl. 83-140.000.
Grantland, Gary, to GTE Automatic Electric Inc. Electronic common switch having an improved receiver mating arrangement. 4,442,322, Cl. 179-81.00R.
Gray, Keith I.; and Meier, Henry G., to Brown Boveri Electric Inc. Dead tank housing for high voltage circuit breaker employing puffer interrupters. 4,442,329, Cl. 200-148.00B.
Greco, Ralph S.; and Harvey, Richard A. Antibiotic bonding of vascular prostheses and other implants. 4,442,133, Cl. 427-2.000.
Green, Robert C.: *See*—
Burchfield, James E.; and Green, Robert C., 4,441,985, Cl. 208-11.00R.
Greenbaum, Elias, to United States of America, Energy. Method for producing hydrogen and oxygen by use of algae. 4,442,211, Cl. 435-168.000.
Greenlee, William J., to Merck & Co., Inc. Process for preparing carboxyalkyl dipeptides. 4,442,030, Cl. 260-112.50R.
Greenquist, Alfred C.; and Walter, Bert, to Miles Laboratories, Inc. Homogeneous specific binding assay device and preformed complex method. 4,442,204, Cl. 435-7.000.
Greenwald, Fred A., to General Connectors Corp. Duct seal. 4,441,723, Cl. 277-164.000.
Greeson, Logan C. Column form. 4,441,685, Cl. 249-51.000.
Greiner, Leonard. Chemical heat pump. 4,441,484, Cl. 126-436.000.
Greiner, Wolfgang H. A.; and Mauch, Magnus. Flexible two-dimensional material. 4,442,150, Cl. 428-53.000.
Gries, Richard C. Metallic security bar system for window and patio doors. 4,441,299, Cl. 52-656.000.
Griffin, David A.; and Collins, David J., to Imperial Chemical Industries PLC. Herbicidal urea derivatives. 4,441,917, Cl. 71-103.000.
Griffin, Michael D., to Amtel, Inc. Piggable multichamber fluid swivel. 4,441,522, Cl. 137-615.000.
Griffith, Ronald L.; and Favstritsky, Nicolai A., to Fiber Industries, Inc. Esterification of carboxyl end groups employing addition of oxirane compounds. 4,442,058, Cl. 264-176.00R.
Grigoleit Company, The: *See*—
Howie, Robert K., Jr., 4,441,230, Cl. 16-121.000.
Grogler, Gerhard; and Kallert, Wilhelm, to Bayer Aktiengesellschaft. Heterogeneous systems of polyol/diphenyl methane uret dione diisocyanates and a process for their production. 4,442,280, Cl. 528-54.000.
Grommes, Helmut: *See*—
Dibowski, Gunter; and Grommes, Helmut, 4,441,720, Cl. 277-3.000.
Grubb, Daniel B., to AMP Incorporated. Method and apparatus for serially producing harness assemblies. 4,441,251, Cl. 29-861.000.
Grudich, George, to Paragon Resources, Inc. Bi-metallic vane vent damper. 4,441,653, Cl. 236-93.00R.
Grudowski, Raymond A.: *See*—
Dummermuth, Ernst H.; Galdun, Daniel J.; Grudowski, Raymond A.; and Stewart, Daniel L., 4,442,504, Cl. 364-900.000.
Grupping, Arnold W. J. Method for the underground gasification of coal or browncoal. 4,441,554, Cl. 166-261.000.
GTE Automatic Electric Inc.: *See*—
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GTE Laboratories Incorporated: *See*—
Finkel, Joel R.; Freudenthal, William E.; and Stoides, John G., 4,442,541, Cl. 382-7.000.
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,441,894, Cl. 51-295.000.
GTE Products Corporation: *See*—
Caldwell, David H.; and Hurley, Robert M., 4,441,650, Cl. 229-39.00B.
Morris, Merle E.; Rice, Lawrence M.; and Meade, Steven L., 4,442,374, Cl. 313-316.000.
Guarr, David A. Lock device for vehicle hoods. 4,441,345, Cl. 70-240.000.
Guerder, Pierre; and Ranson, Andre, to Quartz et Silice. Optical wave guide with fluorine-doped core. 4,441,788, Cl. 350-96.340.
Guerre, Robert P., to Exxon Research and Engineering Co. Recovery of oil from oil-bearing limestone. 4,441,984, Cl. 208-11.0LE.
Guibas, John C.: *See*—
Hantz-Guibas, Diane; and Guibas, John C., 4,441,264, Cl. 36-72.00B.
Guiley, Clifford D., Jr.: *See*—
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Gulf States Paper Corporation: *See*—
Gulliver, Richard F., 4,441,614, Cl. 206-624.000.
Gulf & Western Industries, Inc.: *See*—
Mark, Seymour, 4,441,889, Cl. 44-51.000.
Gulliver, Richard F., to Gulf States Paper Corporation. Front loaded and closed carton with hinged top cover. 4,441,614, Cl. 206-624.000.
Gumble, Thomas N.: *See*—
Brown, Wade R.; and Gumble, Thomas N., 4,441,521, Cl. 137-613.000.
Gupta, Probodh D., to Siemens Aktiengesellschaft. Method and apparatus for recognizing digital information in digital information transmission, particularly in mobil radio communications systems. 4,442,531, Cl. 375-94.000.
Guthke, Horst. Tennis racket string mount. 4,441,712, Cl. 273-73.00D.
Guthlein, Werner: *See*—
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,442,033, Cl. 260-158.000.
Gutman, Arnold D.: *See*—
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H. J. Langen & Sons Limited: *See*—
Langen, Marinus J. M., 4,441,303, Cl. 53-374.000.
Haaf, William R.; Lee, Gim F., Jr.; and Ting, Sei P., to General Electric Company. Impact resistant polyphenylene ether resin compositions. 4,442,251, Cl. 524-141.000.
Haag, Werner O.: *See*—
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Haarmann, Walter: *See*—
Muller, Erich; Nicki, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,442,111, Cl. 424-263.000.
Hachenberg, Horst: *See*—
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Hadano, Yoshikazu: *See*—
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Haden Schweitzer Corporation: *See*—
Bloomer, Ivan, 4,442,049, Cl. 261-148.000.
Haendle, Joerg; and Sklebitz, Hartmut, to Siemens Aktiengesellschaft. X-Ray diagnostic installation for X-ray tomographic images. 4,442,534, Cl. 378-21.000.
Haendle, Joerg, to Siemens Aktiengesellschaft. Diagnostic x-ray installation. 4,442,537, Cl. 378-99.000.
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Haga, Ryooichi: *See*—
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Yoji, 4,442,006, Cl. 210-613.000.
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Hahm, Gerhard H., to Zimmerman, Jos. Axially telescopic coil carrier. 4,441,665, Cl. 242-129.000.

Hahn, Kenneth G., Jr.: *See*—
Borovicka, David A., Sr.; Hahn, Kenneth G., Jr.; and Tupa, John T., 4,442,257, Cl. 524-555.000.
Hahn, Roger A., to Adolph Coors Company. Overvarnish apparatus for decorator machine. 4,441,418, Cl. 101-38.00R.
Haimbach, Frank, IV: *See*—
Smith, Zan P.; and Haimbach, Frank, IV, 4,442,004, Cl. 210-448.000.
Hain, Paul O.; and Lepisto, J. George, to Champion International Corporation. Container with resealable closure. 4,441,613, Cl. 206-621.000.
Hajek, Zdenek: *See*—
Emmer, Ivan; Hajek, Zdenek; and Repa, Petr, 4,441,968, Cl. 204-35.00N.
Hall, Robert E., to Fidelity Grafcor, Inc. Pizza box. 4,441,626, Cl. 220-443.000.
Hall, William E., to Floating Point Systems, Inc. Instruction cache memory system. 4,442,488, Cl. 364-200.000.
Halliburton Company: *See*—
Daniel, Joseph T., 4,442,410, Cl. 330-289.000.
Hamman, Reed K., 4,441,552, Cl. 166-133.000.
Harris, Allen E.; and Szarka, David D., 4,441,721, Cl. 277-26.000.
Hambrecht, Juergen: *See*—
Brandstetter, Franz; Hambrecht, Juergen; Stephan, Rudolf; Overhoff, Heinz-Juergen; Schwaab, Josef; Bernhard, Claus; Swoboda, Johann; and Echte, Adolf, 4,442,263, Cl. 525-83.000.
Hamer, Dean H.; and Gerin, John, to United States of America, Health and Human Services. Simian virus recombinant that directs the synthesis of hepatitis B surface antigen. 4,442,205, Cl. 435-68.000.
Hamman, Reed K., to Halliburton Company. Hydraulic setting tool with flapper valve. 4,441,552, Cl. 166-133.000.
Hammond, R. Philip: *See*—
Latter, Albert L.; Hammond, R. Philip; and Dooley, James L., 4,442,065, Cl. 376-280.000.
Hams, Kenneth A., to Bell & Howell Company. Indicia reading method and apparatus. 4,442,347, Cl. 235-474.000.
Handte, Reinhard; Sander, Jurgen; and Tammer, Thomas, to Hoechst Aktiengesellschaft. Process for the preparation of halo-2-mercaptobenzoxazoles. 4,442,294, Cl. 548-221.000.
Hanna, Daniel C. Car washing apparatus. 4,441,226, Cl. 15-53.0AB.
Hannebaum, Heinz: *See*—
Degner, Dieter; and Hannebaum, Heinz, 4,441,970, Cl. 204-59.00R.
Hansen, James L. Aeration fan mounting system. 4,441,403, Cl. 98-55.000.
Hanson, Richard A., to Sundstrand Data Control, Inc. Flexure with electrical conductor. 4,441,366, Cl. 73-517.00B.
Hantel, Alwin, to Thyssen Industrie Aktiengesellschaft. Rear door for armored vehicles. 4,441,754, Cl. 296-51.000.
Hantz-Guibas, Diane; and Guibas, John C. Driver's heel guard. 4,441,264, Cl. 36-72.00B.
Hanyu, Susumu; and Takenoya, Hideaki, to Janome Sewing Machine Co., Ltd. Stitch function switching system for sewing machines. 4,441,439, Cl. 112-158.00E.
Happel, Fritz; and Happel, Werner, to Happel, Fritz. Milking apparatus. 4,441,454, Cl. 119-14.360.
Happel, Werner: *See*—
Happel, Fritz; and Happel, Werner, 4,441,454, Cl. 119-14.360.
Hara, Akinori, to Osawa Press Mfg., Co., Ltd. Wire cutter and stripper apparatus. 4,441,386, Cl. 81-9.510.
Hara, Akio; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Sintered body for use in a cutting tool and the method for producing the same. 4,442,180, Cl. 428-551.000.
Harbison, William C.: *See*—
White, William H.; Harbison, William C.; and Nelson, Gary L., 4,442,168, Cl. 428-331.000.
Hardware Designers, Inc.: *See*—
Fielding, Brian S.; and Leiper, Fred S., 4,441,772, Cl. 312-330.00R.
Leiper, Fred B., 4,441,773, Cl. 312-330.00R.
Haremsa, Johannes: *See*—
Zolner, Dieter H.; Rittmann, Friedrich; Dung, Herbert; Haremsa, Johannes; Bauer, Georg; Otto, Josef; Muhlenbeck, Josef; and Lauterbach-Dammler, Inge, 4,442,525, Cl. 373-93.000.
Harootion, Aramis, to Whittaker Corporation. Electrically sealed connector and cable assembly. 4,441,777, Cl. 339-94.00M.
Harris, Allen E.; and Szarka, David D., to Halliburton Company. High temperature packer with low temperature setting capabilities. 4,441,721, Cl. 277-26.000.
Harris Corporation: *See*—
Klein, Robert E., 4,442,373, Cl. 313-35.000.
Harris, David A., to Owens-Corning Fiberglas Corporation. Aesthetic acoustical air distribution duct system. 4,441,402, Cl. 98-40.00C.
Harry, Ieuan L., to Continental Group, Inc., The. Bottle ejector. 4,441,878, Cl. 425-534.000.
Harry Major Machine and Tool Co.: *See*—
Miller, Jack E.; and Brandenburg, Robert C., 4,441,606, Cl. 198-751.000.
Hartman, Seymour; and Brown, Timothy M., to Champion International Corporation. Phenol-aldehyde bentonite adhesive composition in wood lamination process. 4,441,954, Cl. 156-291.000.
Hartwig, Ernst; and Krallmann, Reinhold, to BASF Aktiengesellschaft. Anthraquinone dyes. 4,442,287, Cl. 544-187.000.
Hartwig-Hartoglass, Inc.: *See*—
Abell, Irwin R., 4,441,290, Cl. 52-202.000.
Harvey, Christian D.: *See*—
Harvey, Douglas G., deceased; Harvey, Dolores C., executrix; and Harvey, Christian D., 4,442,216, Cl. 435-288.000.
Harvey, Dolores C., executrix: *See*—
Harvey, Douglas G., deceased; Harvey, Dolores C., executrix; and Harvey, Christian D., 4,442,216, Cl. 435-288.000.
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Harvey, Ian G.: *See*—
Jackson, William B.; Harvey, Ian G.; and Warren, Philip H., 4,442,332, Cl. 219-10.670.
Harvey, Richard A.: *See*—
Greco, Ralph S.; and Harvey, Richard A., 4,442,133, Cl. 427-2.000.
Hasenbalg, Ralph D. Keyboard actuator. 4,441,833, Cl. 400-180.000.
Hashimoto, Takashi: *See*—
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Hashimoto, Takashi; and Shibukawa, Nobuyuki, 4,442,087, Cl. 424-85.000.
Haskel, Inc.: *See*—
Vogel, Benjamin, 4,441,862, Cl. 417-250.000.
Hatakeyama, Takanobu: *See*—
Mitsui, Nobuo; Maeda, Yasuyuki; Kurihara, Tomiaki; Shima, Seiya; Hatakeyama, Takanobu; and Komuro, Katsu, 4,441,584, Cl. 187-29.00R.
Haugk, Charles A., to General Engineering & Manufacturing Corp. Locking and positioning apparatus for reclining seats. 4,441,381, Cl. 74-531.000.
Hawa AG.: *See*—
Sommerhalder, Rudolf, 4,441,581, Cl. 181-286.000.
Hawkins, Peter A. T. Crusher for scrap metal and the like. 4,441,415, Cl. 100-35.000.
Haws, John R., to Phillips Petroleum Company. Polymeric blends. 4,442,265, Cl. 525-91.000.
Hayashi, Nobuhiko, to Noma, Takumi. Solid fuel burning methods and apparatus. 4,441,436, Cl. 110-315.000.
Hayashida, Shizuo; and Masuko, Akinori, to Tokyo Shibaura Denki Kabushiki Kaisha. Television receiver phase locked loop tuning arrangement. 4,442,413, Cl. 331-1.00A.
Heard, Thomas J.: *See*—
Welch, William R.; and Heard, Thomas J., 4,441,558, Cl. 166-317.000.
Heber, Helmut; Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Schick, Manfred, to Behringwerke Aktiengesellschaft. Process for the preparation of plasminogen and plasminogen thus prepared. 4,442,213, Cl. 435-217.000.
Hebert, Raymond A., Jr.; Levine, Lewis J.; and Shipp, Kenneth O., Jr., to International Business Machines. Method for performing a multiple page get operation in a text processing system. 4,441,829, Cl. 400-63.000.
Heck, Roland H.; Rosinski, Edward J.; and Shih, Stuart S., to Mobil Oil Corporation. Hydrotreating hydrocarbon feedstocks. 4,442,023, Cl. 502-222.000.
Heckler, Hatto; Petersen, Godber; and Frick, Alfons, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet separating and transport apparatus. 4,441,390, Cl. 83-154.000.
Hedlund, Lee V.; and Shields, Jerome D., to RCA Corporation. Tunnel for tape accumulation during wind-off. 4,442,465, Cl. 360-130.230.
Heeger, Alan J.: *See*—
MacDiarmid, Alan G.; Heeger, Alan J.; and Nigrey, Paul J., 4,442,187, Cl. 429-213.000.
Heffner, Edna V. Weighting scale hand support device. 4,441,568, Cl. 177-129.000.
Heide, Helga: *See*—
Konig, Rainer; Freund, Hans-Ulrich; Heide, Helga; and Sieglen, Rolf A., 4,441,616, Cl. 209-44.100.
Heilos, Johannes: *See*—
Arntz, Dietrich; Prescher, Gunter; and Heilos, Johannes, 4,442,308, Cl. 568-480.000.
Heimburger, Norbert: *See*—
Heber, Helmut; Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Schick, Manfred, 4,442,213, Cl. 435-217.000.
Hein, Paul R.: *See*—
Tsao, Jung-Hsien; and Hein, Paul R., 4,442,198, Cl. 430-311.000.
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, to Kali-Chemie Pharma GmbH. 1,5-Diphenylpyrazolin-3-one compounds, process and intermediates for preparation thereof and pharmaceutical compositions containing same. 4,442,102, Cl. 424-250.000.
Hencken, Kenneth R.; Tichenor, Daniel A.; and Wang, James C. F., to United States of America, Energy. Optical double-slit particle measuring system. 4,441,816, Cl. 356-335.000.
Hendricks, Bacel G. Open end ratchet wrench. 4,441,387, Cl. 81-61.000.
Hennenberger, Peter: *See*—
Rau, Wolfgang; Klamann, Helmut; and Hennenberger, Peter, 4,442,271, Cl. 526-61.000.
Hennessey, Richard G., to International Harvester Co. Steering light arrangement. 4,442,477, Cl. 362-52.000.
Henriksen, Niels J.: *See*—
Beierholm, Hans M.; and Henriksen, Niels J., 4,442,394, Cl. 318-807.000.
Hentschel, Peter; Brodowski, Walter; and Zengel, Hans, to AKZO nv. Thermoplastic polyurethane-elastomers from cyclohexane-1,4-diisocyanate. 4,442,281, Cl. 528-79.000.
Hentschel, Peter: *See*—
Goring, Hermann; Hentschel, Peter; and Meyl, Wolfgang, 4,442,497, Cl. 364-561.000.
Henzler, Roland: *See*—
Dettelbach, Alfred; and Henzler, Roland, 4,441,450, Cl. 118-681.000.

Hercules Incorporated: *See*—
Pohl, Rudolph L., 4,442,302, Cl. 204-159.230.
Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., 4,442,063, Cl. 264-532.000.

Hermann, Bodo: *See*—
Lux, Werner; Vahlensieck, Jurgen; Zell, Jakob; Hermann, Bodo; Bartsch, Heinz; and Zimmermann, Horst, 4,442,334, Cl. 219-73.000.

Herndon, William H., to Fairchild Camera & Instrument Corporation. Bit line powered translinear memory cell. 4,442,509, Cl. 365-154.000.

Herrick, Benjamin M.: *See*—
Taft, Charles K.; and Herrick, Benjamin M., 4,441,526, Cl. 137-831.000.

Herwig, Warren E., to Allis-Chalmers Corp. Tailings monitor for combine harvester. 4,441,513, Cl. 130-27.00B.

Hesp, Theodorus G. M.: *See*—
Boelens, Harmannus; van der Weerdt, Antonius J. A.; and Hesp, Theodorus G. M., 4,442,025, Cl. 252-522.00R.

Hess, Joachim. Protective equipment cabinet. 4,441,766, Cl. 312-214.000.

Heuschmann, Herr F.; and Plank, Herr A., to Compur-Electronic GmbH. Signal transmission. 4,442,426, Cl. 340-539.000.

Hicken, Michael G.; Kirschensteiner, Fred; True, Duane A.; and Taleff, Alexander, to Westinghouse Electric Corp. Spent fuel consolidation system. 4,441,242, Cl. 29-419.00R.

Hicswa, Daniel, to Becton, Dickinson and Company. Detachable balloon catheter device and method of use. 4,441,495, Cl. 128-325.000.

Hidden Valley Associates: *See*—
Phillips, Edward H., 4,441,517, Cl. 134-113.000.

Higashi, Hidejiro: *See*—
Yoshida, Satoshi; and Higashi, Hidejiro, 4,442,323, Cl. 179-110.00A.

Higton, Malcolm; and Vecht, Aron, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Phosphors. 4,442,377, Cl. 313-503.000.

Higuchi, Yoshihiro: *See*—
Watanabe, Koji; Higuchi, Yoshihiro; Yagi, Michio; and Shiozawa, Kazuo, 4,441,798, Cl. 354-483.000.

Hijuelos, Humberto; Scartozzi, Giulio; Vollmuth, Lawrence P.; and Basile, Raffaele, to Allied Tube & Conduit Corporation. Continuous production of polished and buffed tubing. 4,441,238, Cl. 29-33.00D.

Hill, Alan E. Plasma switch. 4,442,383, Cl. 315-349.000.

Hill, Geoffrey E.; Woffinden, Duard S.; and Chadwick, Duane G., to Utah State University Foundation. Apparatus and method for measuring concentrations of supercooled liquid water. 4,441,363, Cl. 73-170.00R.

Hill, William E.; and McAuliffe, Charles A., to Facilitated Separations, Inc. Manganese compounds and sorption of gases using manganese compounds. 4,442,297, Cl. 549-206.000.

Hillberg, Ernest T. Controlled mooring. 4,441,448, Cl. 114-230.000.

Hines, Alex E., to Occidental Oil Shale, Inc. Method for closing a drift between adjacent in situ oil shale retorts. 4,441,760, Cl. 299-2.000.

Hirabayashi, Yuzi: *See*—
Shirasaki, Shinji; Tsuzuki, Yoshihiko; Hirabayashi, Yuzi; Okazaki, Hiroshi; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,442,424, Cl. 340-52.00F.

Hirai, Kiyoshi: *See*—
Sumi, Masao; Suenaga, Junichi; Takenaka, Masazo; Murano, Itaru; Tanabe, Mikio; and Hirai, Kiyoshi, 4,442,252, Cl. 524-183.000.

Hiraishi, Hisashi; Yamakami, Yoshiaki; and Shintani, Atsunobu, to Kubota Ltd. Non-magnetic alloy having high hardness. 4,441,926, Cl. 75-128.00A.

Hirano, Takashi, to Yamato Scale Company, Limited. Combination weighing machine. 4,441,567, Cl. 177-25.000.

Hirasawa, Kunio: *See*—
Oshita, Youichi; Sato, Shunji; Takahashi, Takeshi; and Hirasawa, Kunio, 4,442,330, Cl. 200-148.00A.

Hitachi, Ltd.: *See*—
Ikegawa, Masato; Sato, Eiji; and Tojo, Kenji, 4,441,870, Cl. 418-55.000.
Iwata, Yoshio; Fujita, Tsutomu; Horiuchi, Tsunehisa; and Shimizu, Youichi, 4,442,456, Cl. 358-213.000.
Kanoi, Minoru; Hori, Yasuro; and Maejima, Masaaki, 4,442,419, Cl. 336-100.000.
Maekawa, Hitoshi; Osawa, Michitaka; and Ando, Kunio, 4,442,384, Cl. 315-399.000.
Mitsui, Nobuo; Maeda, Yasuyuki; Kurihara, Tomiaki; Shima, Seiya; Hatakeyama, Takanobu; and Komuro, Katsu, 4,441,584, Cl. 187-29.00R.
Miyamoto, Akira, 4,441,435, Cl. 110-245.000.
Okamoto, Hiroshi; Seki, Michiharu; and Ohayashi, Hidehito, 4,441,981, Cl. 204-426.000.
Oshita, Youichi; Sato, Shunji; Takahashi, Takeshi; and Hirasawa, Kunio, 4,442,330, Cl. 200-148.00A.
Ota, Hideo; and Kubo, Yutaka, 4,442,485, Cl. 364-200.000.
Ueno, Sadayasu, 4,441,982, Cl. 204-426.000.

Hitachi Medical Corporation: *See*—
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; Fukino Tadashi; and Yoshida, Minoru, 4,442,360, Cl. 250-486.100.

Hitachi Metals, Ltd.: *See*—
Yamashita, Keitaro; and Kashiwagi, Hiromi, 4,441,636, Cl. 222-541.000.

Hitch, Billy F.: *See*—
Getz, Marlyn F.; Maggio, Michael J.; and Hitch, Billy F., 4,441,927, Cl. 75-229.000.

Hobson, James C., to Ex-Cell-O Corporation. Rack and pinion weapon elevation mechanism. 4,441,401, Cl. 89-37.00F.

Hochtemperatur-Reaktorbau GmbH: *See*—
Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Fritz, Rolf; and Kissel, Karl-Friedrich, 4,442,066, Cl. 376-302.000.

Hodel, Ulf: *See*—
Wagner, Alfred; Ames, Adolf; and Hodel, Ulf, 4,441,646, Cl. 228-116.000.

Hoechst Aktiengesellschaft: *See*—
Albrecht, Konrad; Frensch, Heinz; and Schumacher, Hans, 4,441,919, Cl. 71-120.000.
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,442,304, Cl. 560-232.000.
Handte, Reinhard; Sander, Jurgen; and Tammer, Thomas, 4,442,294, Cl. 548-221.000.
Johannes, Gerhard; Shroff, Fali; Dullis, Gerhard; and Steidl, Dieter, 4,442,244, Cl. 523-221.000.
Leupold, Ernst I.; Schmidt, Hans-Joachim; Wunder, Friedrich; Arpe, Hans-Jurgen; and Hachenberg, Horst, 4,442,228, Cl. 518-714.000.
Meininger, Fritz; Otten, Joachim W., deceased; Otten, Ursla, heir; and Rudolph, Anna G., heir, 4,442,288, Cl. 544-189.000.
Moraw, Roland; and Schadlich, Renate, 4,441,945, Cl. 156-108.000.

Hoeffken, Russell W., to Snyder General Corporation. Method of manufacturing a heat exchanger unit. 4,441,241, Cl. 29-157.30R.

Hoff, Kurt W.: *See*—
TenEyck, John D.; Smith, Russell D.; and Hoff, Kurt W., 4,442,219, Cl. 501-95.000.

Hoffman, Simon J. Holder for saber saw blade. 4,441,255, Cl. 30-392.000.

Hoffmann-La Roche Inc.: *See*—
Berger, Leo; and Olson, Gary L., 4,442,291, Cl. 546-150.000.
Felix, Arthur M.; Ishitsuka, Hideo; Meienhofer, Johannes A.; and Ohta, Yumiko, 4,442,031, Cl. 260-112.50R.
Kienzle, Frank, 4,442,289, Cl. 544-280.000.

Hogan, Mark J.; and Cooke, Ernest R., to Brunswick Corporation. Collapsible support fixture for camouflage screens or the like. 4,441,518, Cl. 135-98.000.

Hogendobler, Richard S.: *See*—
Forney, Edgar W., Jr.; and Hogendobler, Richard S., 4,441,781, Cl. 339-177.00R.

Hohlein, Peter: *See*—
Probst, Joachim; Riberi, Bernd; Kolb, Gunter, deceased; and Hohlein, Peter, 4,442,145, Cl. 427-385.500.

Hohman, Charles M.: *See*—
Propster, Mark A.; Seng, Stephen; and Hohman, Charles M., 4,441,906, Cl. 65-27.000.

Hollinger, William K., Jr. Heat sealing machine and process for heat sealing plastic film edges. 4,441,953, Cl. 156-290.000.

Hollingsworth (U.K.) Limited: *See*—
Parker, Alan; and Clough, Douglas O., 4,441,310, Cl. 57-401.000.

Holman, George B.: *See*—
Powers, Charles A.; and Holman, George B., 4,441,556, Cl. 166-290.000.

Holmes, Gordon J., to Northern Telecom Limited. Resoldering tool for ceramic substrate hybrid electronic circuits. 4,441,647, Cl. 228-119.000.

Holt, Earl R., to Hose Specialties Company. Filter assembly. 4,442,003, Cl. 210-445.000.

Holt, George. Economizer. 4,441,477, Cl. 123-557.000.

Holtrop, John W., to United States of America, Navy. Constrained store ejector. 4,441,674, Cl. 244-137.00R.

Holtzman, Barry L.; and Mercier, George E., to Westinghouse Electric Corp. Multi-section power capacitor with internal fusing arrangement. 4,442,473, Cl. 361-275.000.

Holubka, Joseph W., to Ford Motor Company. Diblocked diisocyanate diurea oligomers and coating compositions comprising same. 4,442,146, Cl. 427-386.000.

Holzt, Hans-Peter: *See*—
Bernauer, Otto; Holzt, Hans-Peter; and Lenz, Hermann, 4,441,326, Cl. 62-7.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kohyama, Mikihiro; and Ohta, Kozo, 4,441,574, Cl. 180-219.000.

Honeywell Inc.: *See*—
Bonne, Ulrich, 4,441,335, Cl. 62-324.600.
Brahmbhatt, Dhaval J., 4,442,481, Cl. 363-60.000.

Hope, Robert J.: *See*—
Argyle, Charles S.; Beldam, Richard P.; and Hope, Robert J., 4,441,547, Cl. 165-67.000.

Hopefl, Richard M.: *See*—
Wedral, Elaine R.; Hopefl, Richard M.; and Ivie, Rufus A., 4,442,104, Cl. 426-250.000.

Hore, Donald L., to Hornet Electrical Company Limited. Electric indexing drive and stepping motor with drive retardation therefor. 4,442,392, Cl. 318-696.000.

Hori, Yasuro: *See*—
Kanoi, Minoru; Hori, Yasuro; and Maejima, Masaaki, 4,442,419, Cl. 336-100.000.

Horiguchi, Satoru: *See*—
Takeuchi, Hideo; Horiguchi, Satoru; and Tamaki, Ryuzo, 4,441,819, Cl. 356-380.000.

Horii, Masami: *See*—
Ochiai, Kuniaki; Horii, Masami; and Aoki, Osamu, 4,441,828, Cl. 400-124.000.

Horinishi, Katsumi: *See*—
Maruyama, Yuji; and Horinishi, Katsumi, 4,441,797, Cl. 354-416.000.

Horiuchi, Tsunehisa: *See*—
Iwata, Yoshio; Fujita, Tsutomu; Horiuchi, Tsunehisa; and Shimizu, Youichi, 4,442,456, Cl. 358-213.000.

Hornbeck, Larry J., to Texas Instruments Incorporated. Deformable mirror light modulator. 4,441,791, Cl. 350-360.000.

Hornet Electrical Company Limited: *See*—
Hore, Donald L., 4,442,392, Cl. 318-696.000.

Horovitz, Zola P., to E. R. Squibb & Sons, Inc. Method for treating glaucoma with topical or systemic ACE inhibitor compositions. 4,442,089, Cl. 424-177.000.

Horwath, Robert O.; and Ibrahim, Osama O., to Nabisco Brands, Inc. Process for production of glucosone. 4,442,207, Cl. 435-105.000.

Hose Specialties Company: *See*—
Holt, Earl R., 4,442,003, Cl. 210-445.000.

Hoshino, Mitsuru: *See*—
Yusa, Haruhiko; Hoshino, Mitsuru; Kurosaki, Akira; Furusawa, Hironobu; and Sugitawa, Chikara, 4,442,262, Cl. 525-69.000.

Hoshino, Yasushi: *See*—
Momose, Haruhiko; Takahashi, Toshiaki; and Hoshino, Yasushi, 4,441,810, Cl. 356-1.000.

Hosie, Alistair M. Opener and pouring spout with holder for flexible wall containers. 4,441,631, Cl. 222-86.000.

Hotta, Teruyuki; Kurokawa, Yoshiki; Nagasaku, Eiichi; and Yasunaga, Masao, to Nippondenso Co., Ltd. Variable discharge rotary compressor. 4,441,863, Cl. 417-281.000.

Houghton, Alexander J.; and Knasel, Thomas M., to Science Applications, Inc. Vessel navigation lights. 4,441,783, Cl. 350-96.100.

Houston Protective Equipment, Inc.: *See*—
Donzis, Byron A., 4,441,211, Cl. 2-2.000.

Howald, Frank P., to Fluor Corporation. Flotation process. 4,441,993, Cl. 209-5.000.

Howard, Henry R. Apparatus for dispensing particulate matter. 4,441,434, Cl. 110-101.00R.

Howie, Robert K., Jr., to Grigoleit Company, The. Molded knob with resilient friction fit finger. 4,441,230, Cl. 16-121.000.

Hoyt, Richard E.: *See*—
Nielsen, Anker J., Jr.; and Hoyt, Richard E., 4,441,343, Cl. 70-34.000.

HRI Inc.: *See*—
Kydd, Paul H., 4,441,943, Cl. 149-109.400.

Hrovatin, Albert; and Brezec, Joze, to Do-Mehanotehnika, Proizvodnja in Prodaja Igrac, Kovinskih in Plasticnih Izdelkov N.Sol.O. Sewing-machine frame. 4,441,443, Cl. 112-258.000.

Hrubesh, Charles P., to United States of America, Army. Apparatus and method for generating single droplets. 4,441,532, Cl. 141-1.000.

Hsu, Chao-Yang; and Lyons, James E., to Sun Tech, Inc. Process for oxidizing phenol to benzoquinone. 4,442,036, Cl. 260-396.00R.

Huang, Yun-Yang, to Mobil Oil Corporation. Hollow shaped catalytic extrudates. 4,441,990, Cl. 208-111.000.

Hubble, William S.: *See*—
Most, Ivan G.; and Hubble, William S., 4,441,922, Cl. 75-25.000.

Hubele, Adolf: *See*—
Kunz, Walter; Eckhardt, Wolfgang; Hubele, Adolf; and Riebli, Peter, 4,442,117, Cl. 424-273.00R.

Huber, Willi, to J. Wagner AG. Electrostatic disabling switch for electrostatic spray guns. 4,441,656, Cl. 239-708.000.

Hubred, Gale L.; and Van Leirsburg, Dean A., to Chevron Research Company. Recovery of cobalt, molybdenum, nickel and vanadium from an aqueous ammonia and ammonium salt solution by serial extraction of nickel and cobalt and coextracting molybdenum and vanadium. 4,442,074, Cl. 423-54.000.

Huchett, Michael: *See*—
Gosset, Serge; and Huchett, Michael, 4,441,937, Cl. 148-18.000.

Hucker, David J., to Sundstrand Corporation. Generator system with fault condition excitation. 4,442,396, Cl. 322-21.000.

Huggins, Orville C., to Monarch Marking Systems, Inc. Printing apparatus. 4,441,425, Cl. 101-292.000.

Hughes Aircraft Company: *See*—
Bleakney, William M., 4,442,431, Cl. 343-7.0ED.
Giants, Thomas W., 4,442,278, Cl. 526-261.000.
Pines, Michael Y., 4,442,457, Cl. 358-213.000.

Hughes Tool Company: *See*—
Baugh, John L.; and Montgomery, James W., 4,441,560, Cl. 166-382.000.
Evans, Robert W.; and Montgomery, James W., 4,441,559, Cl. 166-382.000.
Pessier, Rudolf C. O.; Ippolito, Rodolfo M.; and Baker, Billy E., 4,441,566, Cl. 175-374.000.

Huie, Nicholas C.; and Bradley, William, to Standard Oil Company (Indiana). Decreasing static charge of a particulate solid product which causes product to plug metal line used for pneumatic fluidized solid conveyance. 4,441,657, Cl. 241-14.000.

Huignard, Jean P.; and Malard, Marcel, to Thomson-CSF. Optical system for observation in real time with scanning. 4,442,455, Cl. 358-209.000.

Hulin, Jean P.; Bouvard, Andre; and LeMaitre, Patrick, to Lignes Telegraphiques et Telephoniques. Device for positioning optical fibers in a terminal connector for splicing two optical fiber transmission cables. 4,441,786, Cl. 350-96.210.

Hulse, David O., to Budd Company, The. Tire pressurization control system. 4,441,539, Cl. 152-417.000.

Hunnell, John W.: *See*—
Autrey, Harry S.; and Hunnell, John W., 4,442,130, Cl. 426-462.000.

Hunter Douglas International N.V.: *See*—
Rijnders, Willem, 4,441,297, Cl. 52-478.000.

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Thual, Jacques G. L., 4,441,282, Cl. 52-39.000.

Hurley, Robert M.: *See*—
Caldwell, David H.; and Hurley, Robert M., 4,441,650, Cl. 229-39.00B.

Hurst, G. Samuel; Parks, James E.; and Schmitt, Harold W., to Atom Sciences, Inc. Sputter initiated resonance ionization spectrometry. 4,442,354, Cl. 250-281.000.

Hurst, Richard F. Apparatus for producing bacteria free drinking water. 4,441,996, Cl. 210-241.000.

Hutchins, Ned M.; Studebaker, Irving G.; Kvapil, Rudolf; and Ricketts, Thomas E., to Occidental Oil Shale, Inc. In situ oil shale retort system. 4,441,759, Cl. 299-2.000.

Hutchinson, Earl. Combination portable seat cushion and pennant. 4,441,271, Cl. 40-584.000.

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Hydrovane Compressor Company Limited: *See*—
Boller, Edward, 4,441,871, Cl. 418-97.000.

Ibrahim, Osama O.: *See*—
Horwath, Robert O.; and Ibrahim, Osama O., 4,442,207, Cl. 435-105.000.

Ichihashi, Hitoshi; Tanaka, Terukazu; and Imasato, Yu, to Dainippon Pharmaceutical Co., Ltd.; and Laboratoire Roger Bellon. Sesquihydrate of naphthyridine derivative, and process for the preparation thereof. 4,442,101, Cl. 424-250.000.

ICI Americas Inc.: *See*—
Barrett, Joseph A. F., 4,441,427, Cl. 102-202.600.

Idei, Toshio: *See*—
Uchida, Ryohei; Yamasaki, Tatsuo; Idei, Toshio; Tatsutani, Toshio; and Hagiwara, Ippei, 4,442,386, Cl. 318-254.000.

Iemmi, Giuliano; Raimondo, Michele; and Mo, Luigi, to Centro Ricerche Fiat S.p.A. Device for electrolytic surface treatment of mechanical workpieces. 4,441,976, Cl. 204-224.00M.

Igarashi, Akira; and Nakamura, Sukenori, to Fuji Photo Film Co., Ltd. Heat-sensitive recording paper. 4,442,179, Cl. 428-220.000.

Ihle, Nathan C.: *See*—
Wolf, Gary A.; Smith, Jeffrey W.; and Ihle, Nathan C., 4,442,028, Cl. 252-628.000.

Iijima, Zenshiro, to Adger Kogyo Co., Ltd. Ink composition. 4,441,928, Cl. 106-21.000.

Iizuka, Yutaka, to Nippon Kogaku K.K. Albada finder device. 4,441,802, Cl. 354-224.000.

Ikeda, Tokuzo: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,442,062, Cl. 264-518.000.

Ikedo, Yuji, to Pioneer Electronic Corporation. Drive mechanism for cassette tape recording/reproducing apparatus. 4,442,467, Cl. 360-105.000.

Ikegawa, Masato; Sato, Eiji; and Tojo, Kenji, to Hitachi, Ltd. Scroll member. 4,441,870, Cl. 418-55.000.

Ikuo, Yamaguchi; Yasuo, Higashibata; and Masaru, Fujimura, to Takenaka Komuten Co., Ltd. Earthquake-resistant reinforcement structure for an existing building with compression braces or tension braces. 4,441,289, Cl. 52-167.000.

Imahashi, Issei, to Telmec Co., Ltd. Apparatus for registering a mask pattern in a photo-etching apparatus for semiconductor devices. 4,441,250, Cl. 29-578.000.

Imai, Iwao: *See*—
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,441,479, Cl. 123-605.000.

Imamura, Ryuichi; Shimazaki, Kanzo; Yahashi, Satoru; Yamamoto, Takashi; and Yano, Noriyuki, to Yanma Agricultural Equipment Company Limited; and Seirei Industry Company Limited. Driving device of sorting cylinder for use in a rotary type rice hulling and sorting device. 4,441,412, Cl. 99-601.000.

Imamura, Yoshiyuki: *See*—
Uchida, Isamu; and Imamura, Yoshiyuki, 4,441,704, Cl. 271-303.000.

Imasato, Yu: *See*—
Ichihashi, Hitoshi; Tanaka, Terukazu; and Imasato, Yu, 4,442,101, Cl. 424-250.000.

Imax Systems Corporation: *See*—
Shaw, William C., 4,441,796, Cl. 352-184.000.

Imperial Chemical Industries Ltd.: *See*—
Briggs, Peter J.; McAloon, Kevin; and Rideal, Graham R., 4,442,164, Cl. 428-283.000.
Brody, Harry, 4,442,057, Cl. 264-176.00F.
Brody, Harry, 4,442,266, Cl. 525-173.000.

Imperial Chemical Industries PLC: *See*—
Brooks, Herbert; and Waite, Frederick A., 4,442,272, Cl. 526-82.000.
Deans, David R., 4,442,217, Cl. 436-161.000.
Griffin, David A.; and Collins, David J., 4,441,917, Cl. 71-103.000.

Inaba, Hajimu; and Miyashita, Hideo, to Fujitsu Fanuc Limited. Switching device for detecting interruptions in transmission lines. 4,442,521, Cl. 371-68.000.

Inco Limited: *See*—
Young, Charles E.; and Drzewiecki, George, 4,441,897, Cl. 55-112.000.
Industri AB Thule: *See*—
Kurpershoek, Cornelis, 4,441,344, Cl. 70-231.000.
Industrie Pirelli S.p.A.: *See*—
Tangorra, Giorgio, 4,441,466, Cl. 123-179.00S.
Inland Steel Company: *See*—
Carter, William A.; and Martin, Frank A., 4,441,975, Cl. 204-206.000.
Inloes, Douglas S.: *See*—
Michaels, Alan S.; Robertson, Channing R.; Cohen, Stanley N.; Inloes, Douglas S.; and Smith, William J., 4,442,206, Cl. 435-68.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,442,333, Cl. 219-69.00W.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Capacitor-type pulse generator for electrical discharge machining, especially for wire-cutting EDM. 4,442,333, Cl. 219-69.00W.
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Sawada, Yasuhiro; Inoue, Tadashi; and Nishida, Toyoaki, 4,442,389, Cl. 318-642.000.
Instrument AB Scanditronix: *See*—
Brahme, Anders, 4,442,352, Cl. 250-251.000.
Intel Corporation: *See*—
Childs, Robert H. E., Jr.; Klebanoff, Jack L.; and Pollack, Frederick J., 4,442,484, Cl. 364-200.000.
Gargini, Paolo; Beinglass, Israel; and Ahlquist, Norman, 4,441,247, Cl. 29-571.000.
Interlock Industries Limited: *See*—
Davis, Ronald P., 4,441,835, Cl. 403-24.000.
International Business Machines: *See*—
Hebert, Raymond A., Jr.; Levine, Lewis J.; and Shipp, Kenneth O., Jr., 4,441,829, Cl. 400-63.000.
International Business Machines Corporation: *See*—
Dean, Mark E.; Kummer, David A.; and Saenz, Jesus A., 4,442,428, Cl. 340-703.000.
Fletcher, Robert P.; Stein, David M.; and Wladawsky-Berger, Irving, 4,442,487, Cl. 364-200.000.
Jones, Robert E.; and Wood, Donald H., 4,442,519, Cl. 371-27.000.
Konig, Rainer; Freund, Hans-Ulrich; Heide, Helga; and Sieglen, Rolf A., 4,441,616, Cl. 209-44.100.
Korth, Hans-Erdmann, 4,441,784, Cl. 350-96.150.
Krishnamurty, Rajan; and Voltin, John A., 4,442,463, Cl. 360-60.000.
Kumar, Ananda H., 4,442,137, Cl. 427-57.000.
Le, Trung, 4,442,408, Cl. 330-261.000.
Lipschutz, Lewis D.; Meagher, Ralph E.; and Presti, Frank P., 4,442,450, Cl. 357-81.000.
Ludwick, Sandra L.; Pond, Stanley L.; and Rhodes, Robert T., 4,442,356, Cl. 250-324.000.
Petrozello, James R., 4,441,785, Cl. 350-96.200.
Pipkin, David J., 4,442,144, Cl. 427-355.000.
Poliak, Richard M.; Rivenburgh, Dennis L.; and Sambucetti, Carlos J., 4,441,938, Cl. 148-23.000.
Schutt, Dieter; Schwengler, Manfred; Ulland, Hartmut; and Weis, Helmut H., 4,442,503, Cl. 364-900.000.
Smith, Gerald L., 4,441,805, Cl. 355-14.00R.
International Flavors & Fragrances Inc.: *See*—
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,442,012, Cl. 252-8.600.
International Harvester Co.: *See*—
Hennessey, Richard G., 4,442,477, Cl. 362-52.000.
International Paper Company: *See*—
Empie, Howard L., Jr., 4,441,959, Cl. 162-30.100.
Nowacki, Ulrich G., 4,441,377, Cl. 74-105.000.
Inui, Toshiharu: *See*—
Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Murayama, Tomio, 4,442,460, Cl. 358-296.000.
Ionescu, Marian I.; Lenker, Jay A.; and Rosenbluth, Robert F., to Shiley, Inc. Tissue heart valve and stent. 4,441,216, Cl. 3-1.500.
Ionics Incorporated: *See*—
Jain, Surendar M., 4,441,978, Cl. 204-301.000.
Ippolito, Rodolfo M.: *See*—
Pessier, Rudolf C. O.; Ippolito, Rodolfo M.; and Baker, Billy E., 4,441,566, Cl. 175-374.000.
Ipri, Alfred C.; and Stewart, Roger G., to RCA Corporation. Electrically alterable nonvolatile floating gate memory device. 4,442,447, Cl. 357-41.000.
Irie, Namio: *See*—
Ito, Hideo; and Irie, Namio, 4,441,572, Cl. 180-140.000.
Irvine, Robert L. Catalytic reformer process. 4,441,988, Cl. 208-64.000.
Isaki, Mikio, to Pioneer Electronic Corporation. Head drive mechanism for a cassette deck. 4,442,466, Cl. 360-75.000.
Isgur, Irving E.; and DelVecchio, William D., to W. R. Grace & Co. Aqueous-based polyurethane compositions and method of preparation. 4,442,259, Cl. 524-839.000.
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Yoji, to Agency of Industrial Science and Technology, The. Anaerobic digestion process. 4,442,006, Cl. 210-613.000.
Ishigaki, Yukinobu, to Victor Company of Japan, Limited. Noise reduction by integrating frequency-split signals with different time constants. 4,442,546, Cl. 455-72.000.
Ishiguro, Tomoji; and Kizaki, Yoshimi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Process and apparatus for reducing soot. 4,441,971, Cl. 204-164.000.
Ishijima, Hiroshi; and Koga, Toshiyuki, to Seiko Instruments & Electronics Ltd. Fluorescent X-ray film thickness gauge for very small areas. 4,442,535, Cl. 378-50.000.
Ishikawa, Hiroichi; and Mikami, Toshio, to Toko Kabushiki Kaisha. Direct current power circuit. 4,442,397, Cl. 323-275.000.
Ishikawa, Hiroshi: *See*—
Abe, Toshio; Ishikawa, Hiroshi; and Suhara, Shigeo, 4,441,324, Cl. 60-753.000.
Ishikawa, Yasuki: *See*—
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,441,479, Cl. 123-605.000.
Ishikura, Shinichi; Kanda, Kazunori; and Yamaguchi, Shohachiro, to Nippon Paint Company, Ltd. Aqueous coating compositions. 4,442,247, Cl. 523-414.000.
Ishikura, Shinichi: *See*—
Kanda, Kazunori; and Ishikura, Shinichi, 4,442,248, Cl. 523-414.000.
Ishitsuka, Hideo: *See*—
Felix, Arthur M.; Ishitsuka, Hideo; Meienhofer, Johannes A.; and Ohta, Yumiko, 4,442,031, Cl. 260-112.50R.
Ishizuka, Hiroshi. Method and an apparatus for producing titanium metal from titanium tetrachloride. 4,441,925, Cl. 75-84.500.
Isomura, Shigenori; Kodama, Katsuhiko; Kondo, Toshio; and Kobayashi, Akio, to Nippondenso Co., Ltd. Closed loop mixture control using learning data resettable for fuel evaporation compensation. 4,441,473, Cl. 123-440.000.
Itakura, Shinji: *See*—
Onda, Tsutomu; Kano, Keiichi; and Itakura, Shinji, 4,441,966, Cl. 204-26.000.
Italiano, Victor J., to NCR Corporation. Printing solenoid. 4,441,830, Cl. 400-124.000.
Itaya, Kingo: *See*—
Shibayama, Kimio; Itaya, Kingo; and Fujimoto, Teruo, 4,442,199, Cl. 430-323.000.
Ito, Akio: *See*—
Matsuda, Shunsuke; Ito, Akio; Katsuaki, Mitani; Yoshinobu, Murakami; and Tooru, Tamura, 4,442,061, Cl. 264-328.700.
Ito, Hideo; and Irie, Namio, to Nissan Motor Company, Limited. Method and a system for steering a wheeled vehicle. 4,441,572, Cl. 180-140.000.
Ito, Masazumi: *See*—
Shibazaki, Kenji; and Ito, Masazumi, 4,441,804, Cl. 355-14.00R.
Ito, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Device for detecting a space between adjacent blocks of data recorded in a recording medium. 4,442,464, Cl. 360-72.100.
Ito, Yoji: *See*—
Shirasaki, Shinji; Tsuzuki, Yoshihiko; Hirabayashi, Yuzi; Okazaki, Hiroshi; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,442,424, Cl. 340-52.00F.
Ito, Yoshinobu: *See*—
Shiga, Tetsuo; Kimura, Takeo; Ito, Yoshinobu; Akashi, Kageyasu; Akiyama, Minoru; and Matsui, Takeki, 4,442,202, Cl. 430-600.000.
Ito, Yoshinori: *See*—
Nishikawa, Reiji; Satoyama, Shozo; Ito, Yoshinori; and Jyo, Hidetaka, 4,441,974, Cl. 204-192.00R.
Ito, Yoshio: *See*—
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Toba, Hirotaka; Itoh, Masanori; Nakano, Keita; Wakoh, Shoji; Toyoshima, Toshihiko; and Todo, Hidemasa, 4,442,160, Cl. 428-215.000.
ITT Corporation: *See*—
Anhalt, John W., 4,441,776, Cl. 339-91.00R.
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Barnard, Richard H., 4,441,372, Cl. 73-861.220.
Ivalda S.p.A.: *See*—
Cavalcante, Mario, 4,441,610, Cl. 206-361.000.
Ive, John G. S.; and Thirlwall, Alan C. Signal error detecting. 4,442,520, Cl. 371-55.000.
Ivie, Rufus A.: *See*—
Wedral, Elaine R.; Hopefl, Richard M.; and Ivie, Rufus A., 4,442,104, Cl. 426-250.000.
Iwagaki, Masaru: *See*—
Takada, Syun; Kadowaki, Takashi; Okumura, Mitsuhiro; Nakamura, Shinichi; and Iwagaki, Masaru, 4,442,201, Cl. 430-569.000.
Iwaki, Akio; Kita, Noriyasu; Sasazawa, Tatsuya; and Yamaguchi, Hiroyoshi, to Konishiroku Photo Industry Co., Ltd. Photosensitive composition. 4,442,196, Cl. 430-195.000.
Iwasa, Tadanobu; and Ushida, Mituo, to Toyoda Gosei Kabushiki Kaisha. Weather resisting extruded rubbery articles having on the surface thereof a thin layer of a colored rubbery material. 4,442,167, Cl. 428-323.000.
Iwashita, Tomonori: *See*—
Mashimo, Yukio; and Iwashita, Tomonori, 4,441,801, Cl. 354-173.110.
Iwata, Yoshio; Fujita, Tsutomu; Horiuchi, Tsunehisa; and Shimizu, Youichi, to Hitachi, Ltd. Solid-state imaging device. 4,442,456, Cl. 358-213.000.
Iwataki, Isao; Kaeriyama, Minoru; Matsui, Nobuo; and Yamada, Tomio, to Nippon Soda Company, Limited. Heterocyclic compounds. 4,442,116, Cl. 424-270.000.
Izumi, Takusuke, to Anritsu Electric Company Limited. Self-modulating spectrometer. 4,441,815, Cl. 356-328.000.

J. Wagner AG: *See*—
Huber, Willi, 4,441,656, Cl. 239-708.000.
Jackson, John E.; and Doherty, William G., to Union Carbide Corporation. Wear resistant fan blade for centrifugal fan. 4,441,857, Cl. 415-213.00R.
Jackson, Julia S.: *See*—
Mitchell, Terence G.; Barnes, Adrian G.; Jackson, Julia S.; and Bevan, Peter C., 4,441,514, Cl. 131-276.000.
Jackson, William B.; Harvey, Ian G.; and Warren, Philip H., to Electricity Council, The. Heat treatment of rotationally symmetrical workpieces by induction heating. 4,442,332, Cl. 219-10.670.
Jacobson, Robert L., administrator: *See*—
Bishop, Keith C., III; Earls, David E.; Robinson, Richard C.; Blakely, Donald W., deceased; and Jacobson, Robert L., administrator, 4,442,221, Cl. 502-25.000.
Jacobus, Otha J.; and Owen, Donald R. Semiconducting coordination polymers and electrical applications thereof. 4,442,421, Cl. 338-35.000.
Jacquinet, Jean C.: *See*—
Kolar, Cenek; Paulsen, Hans; and Jacquinet, Jean C., 4,442,284, Cl. 536-17.900.
Jain, Surendar M., to Ionics Incorporated. Separation of proteins using electrodialysis - isoelectric focusing combination. 4,441,978, Cl. 204-301.000.
Jakob Muller Forschungs- und Finanz AG: *See*—
Bucher, Robert R., 4,441,530, Cl. 139-432.000.
Jalan, Vinod M.; and Frost, David G., to United States of America, Energy. Method of removing hydrogen sulfide from gases utilizing a zinc oxide sorbent and regenerating the sorbent. 4,442,078, Cl. 423-230.000.
James River-Dixie/Nortern, Inc.: *See*—
Pawlowski, Thomas D., 4,441,608, Cl. 206-45.140.
James, Rolland T.; and Chebra, Ronald J., to Base Ten Systems, Inc. Remote subscriber interaction system. 4,442,320, Cl. 179-5.00R.
Jamieson, Robert S., to California Institute of Technology. Negative coupled inductors for polyphase choppers. 4,442,401, Cl. 323-351.000.
Jandrell, Louis H. M., to Sun-Flex Company, Inc. Coordinate sensing device. 4,442,317, Cl. 178-18.000.
Janome Sewing Machine Co., Ltd.: *See*—
Hanyu, Susumu; and Takenoya, Hideaki, 4,441,439, Cl. 112-158.00E.
Japan Exlan Company, Limited: *See*—
Takegami, Shinsuke; Ban, Kaoru; and Wakitani, Mitsuru, 4,442,173, Cl. 428-372.000.
Jardine, Douglas M., to Kaman Sciences Corporation. Heat reclaiming method and apparatus. 4,441,902, Cl. 62-238.600.
Jarrett, Boaz A.; and Mowbray, Dorian F., to Lucas Industries Limited. Fuel injection pumping apparatus. 4,441,474, Cl. 123-450.000.
Jaspers, Hans: *See*—
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Jasserand, Daniel: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,442,102, Cl. 424-250.000.
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Dill, Terry A., 4,441,651, Cl. 236-49.000.
Jenoptik Jena GmbH: *See*—
Feist, Wieland, 4,441,812, Cl. 356-147.000.
Goring, Hermann; Hentschel, Peter; and Meyl, Wolfgang, 4,442,497, Cl. 364-561.000.
Pohlack, Hubert, 4,441,789, Cl. 350-166.000.
Jensen, James D.: *See*—
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Jeol, Ltd.: *See*—
Tamura, Nobuaki; and Takashima, Susumu, 4,442,355, Cl. 250-310.000.
Jeslis, Jerome: *See*—
Sessions, Robert W.; Jeslis, Jerome; and Rodzen, Richard A., 4,441,500, Cl. 128-641.000.
Johannes, Gerhard; Shroff, Fali; Dullis, Gerhard; and Steidl, Dieter, to Hoechst Aktiengesellschaft. Process for preparing heat-curable, water-dilutable coating compositions for coating metal substrates. 4,442,244, Cl. 523-221.000.
Johnson, David B.: *See*—
Robinson, Robert J.; Johnson, David B.; and Schroeder, Verdell H., 4,441,442, Cl. 112-256.000.
Johnson, Grannis S.: *See*—
Marcellis, Alphonso W.; Johnson, Grannis S.; and Fleming, Joseph P., 4,441,929, Cl. 106-90.000.
Johnson, James D.: *See*—
Flinn, John W.; Johnson, James D.; and Stiemert, Ward L., 4,441,535, Cl. 144-3.00K.
Johnson, Marvin M.: *See*—
McDaniel, Max P.; and Johnson, Marvin M., 4,442,274, Cl. 526-95.000.
Johnson, Milo R., to Texas Instruments Incorporated. Electroluminescent display with laser annealed phosphor. 4,442,136, Cl. 427-53.100.
Johnson, Roger E., to White Consolidated Industries, Inc. Multi-nozzle spray desuperheater. 4,442,047, Cl. 261-66.000.
Johnson, Stanley J., to Deere & Company. Auto spout aimer with delay. 4,441,846, Cl. 414-335.000.
Johnston, David B. R., to Merck & Co., Inc. N-[(5-Halo-2,6-(substituted)pyrazinyl)methylene]amine antimicrobial compounds, compositions and use. 4,442,095, Cl. 424-248.500.
Johnston, David B. R., to Merck & Co., Inc. 2-(Substituted)amino-3-cyano-5-halo-6-(substituted)-pyrazine antimicrobial compounds, compositions and use. 4,442,096, Cl. 424-248.500.
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Jones, Gordon H.; and Young, John M., to Syntex (U.S.A.) Inc. Naphthoquinone anti-psoriatic agents. 4,442,127, Cl. 424-331.000.
Jones, Joseph K.: *See*—
Underbrink, Gary L.; Wilkes, Lambert H.; and Jones, Joseph K., 4,441,232, Cl. 19-48.00R.
Jones, Robert E.; and Wood, Donald H., to International Business Machines Corporation. Memory address sequence generator. 4,442,519, Cl. 371-27.000.
Jonson, Ingvar: *See*—
Karlsson, Bjorn G. E.; and Jonson, Ingvar, 4,442,492, Cl. 364-464.000.
Jost, Steven R.: *See*—
Bouley, Alan C.; Riedl, Harold R.; Jensen, James D.; and Jost, Steven R., 4,442,446, Cl. 357-30.000.
Joubert, Raymond J. M.; and Bouiller, Jean G., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Mounting devices for multiple flow turbojet engines. 4,441,313, Cl. 60-262.000.
Judd, Duncan B.: *See*—
Clitherow, John W.; Bradshaw, John; Mackinnon, John W. M.; Price, Barry J.; Martin-Smith, Michael; and Judd, Duncan B., 4,442,110, Cl. 424-263.000.
Jujo Paper Co., Ltd.: *See*—
Oshima, Hiroyo; Daisaku, Matsukuma; Yutaka, Kojima; Yukio, Kobayashi; and Koichi, Nagai, 4,442,172, Cl. 428-342.000.
Julich, Werner, to Sulzer Brothers Limited. Clutch arrangement for controlling the heddles of a weaving machine. 4,441,528, Cl. 139-66.00R.
Juneau, Paul W., Jr.: *See*—
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Jung, Wilhelm H., to AMF Inc. Anti-friction apparatus for cloth feedplate. 4,441,444, Cl. 112-311.000.
Jyo, Hidetaka: *See*—
Nishikawa, Reiji; Satoyama, Shozo; Ito, Yoshinori; and Jyo, Hidetaka, 4,441,974, Cl. 204-192.00R.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Miyake, Toshio; Ohno, Shoichi; and Sakai, Shuzo, 4,442,209, Cl. 435-119.000.
Kabushiki Kaisha Hosokawa Yoko: *See*—
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Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Sashiki, Takashi; Matsuno, Masaaki; Kobayashi, Noboru; and Mikami, Yoshiharu, 4,441,569, Cl. 177-211.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Asari, Akira; Yamamura, Takashige; and Veno, Tsuneya, 4,441,353, Cl. 72-316.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nagahara, Hiroshi; and Uchimura, Tosio, 4,441,691, Cl. 254-344.000.
Nakahara, Teruo; Ota, Shingo; and Nakamura, Masaru, 4,441,596, Cl. 192-13.00R.
Wakai, Hideyuki; Kashimoto, Masataka; Sakamoto, Chiaki; and Mizutani, Eiji, 4,442,493, Cl. 364-475.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru, 4,442,363, Cl. 307-141.400.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Ishiguro, Tomoji; and Kizaki, Yoshimi, 4,441,971, Cl. 204-164.000.
Kadowaki, Takashi: *See*—
Takada, Syun; Kadowaki, Takashi; Okumura, Mitsuhiro; Nakamura, Shinichi; and Iwagaki, Masaru, 4,442,201, Cl. 430-569.000.
Kaeriyama, Minoru: *See*—
Iwataki, Isao; Kaeriyama, Minoru; Matsui, Nobuo; and Yamada, Tomio, 4,442,116, Cl. 424-270.000.
Kahn, Alan R.; Clark, Kenneth R.; and Bahr, Dennis E., to Meadox Instruments, Inc. Pressure monitoring and leak detection method and apparatus. 4,441,357, Cl. 73-40.000.
Kajimura, Mutsuhiko; and Maeda, Tetsuji, to Sekisui Plastic Co., Ltd. Expandable styrene-maleic anhydride copolymer particles and a process for molding the same. 4,442,232, Cl. 521-56.000.
Kakeya, Nobuharu; Kitao, Kazuhiko; and Nishimura, Ken-ichi, to Kyoto Yakuhin Kogyo Kabushiki Kaisha. Absorption-promoting compounds, compositions thereof with pharmaceuticals and/or bases for rectal administration and method of use. 4,442,090, Cl. 424-178.000.
Kalen, Ragnar: *See*—
Rydell, Nils; and Kalen, Ragnar, 4,441,492, Cl. 128-92.0EB.
Kali-Chemie Pharma GmbH: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,442,102, Cl. 424-250.000.
Kallert, Wilhelm: *See*—
Grogler, Gerhard; and Kallert, Wilhelm, 4,442,280, Cl. 528-54.000.
Kalmanash, Michael H.; and Young, Edward L., to United Technologies Corporation. Differential random color switch for beam penetration CRT. 4,442,451, Cl. 358-73.000.
Kaman Sciences Corporation: *See*—
Jardine, Douglas M., 4,441,902, Cl. 62-238.600.

Kamei, Takao: *See*—
Nakabayashi, Yasuyuki; Matsura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,441,260, Cl. 34-15.000.

Kamio, Kazuyoshi: *See*—
Takagishi, Haruyoshi; Kamio, Kazuyoshi; and Fujikawa, Tsuneo, 4,441,645, Cl. 228-47.000.

Kamoda, Masaru: *See*—
Kataoka, Yushin; Matsuda, Masaaki; and Kamoda, Masaru, 4,442,231, Cl. 521-32.000.

Kampe, Wolfgang: *See*—
Michel, Helmut; Kampe, Wolfgang; and Ofenloch, Roland, 4,442,295, Cl. 548-505.000.

Kanda, Kazunori; and Ishikura, Shinichi, to Nippon Paint Co., Ltd. Aqueous coating compositions. 4,442,248, Cl. 523-414.000.

Kanda, Kazunori: *See*—
Ishikura, Shinichi; Kanda, Kazunori; and Yamaguchi, Shohachiro, 4,442,247, Cl. 523-414.000.

Kanno, Hiromasa: *See*—
Kotani, Shintaro; Abiko, Ichimatsu; Arae, Takashi; Chiba, Mio; Araki, Tomoo; and Kanno, Hiromasa, 4,442,429, Cl. 340-786.000.

Kano, Keiichi: *See*—
Onda, Tsutomu; Kano, Keiichi; and Itakura, Shinji, 4,441,966, Cl. 204-26.000.

Kanoi, Minoru; Hori, Yasuro; and Maejima, Masaaki, to Hitachi, Ltd. Static induction apparatus. 4,442,419, Cl. 336-100.000.

Kantor, Frederick W. Rotary thermodynamic apparatus and method. 4,441,337, Cl. 62-499.000.

Kaplan, Darryl. Energy saving laundry system. 4,441,340, Cl. 68-12.00R.

Karl M. Reich Maschinenfabrik GmbH: *See*—
Farian, Gerhard, 4,441,644, Cl. 227-130.000.

Karl Mengele & Sohne GmbH & Co.: *See*—
Lippl, Wilhelm, 4,441,305, Cl. 56-15.600.

Karlsson, Bjorn G. E.; and Jonson, Ingvar. Device for central reading and registration of customers power consumption. 4,442,492, Cl. 364-464.000.

Karnis, Alkibiadis; and Shallhorn, Paul M. Method and apparatus for on-line monitoring of specific surface of mechanical pulps. 4,441,960, Cl. 162-49.000.

Kasai, Shinichi; Nakagawa, Sotoji; and Osawa, Nobuyuki, to Nippon Seiko Kabushiki Kaisha. Track guide bearing. 4,441,765, Cl. 308-6.00C.

Kasama, Nobuhiro: *See*—
Kitajima, Tadayuki; and Kasama, Nobuhiro, 4,442,190, Cl. 430-53.000.

Kashimoto, Masataka: *See*—
Wakai, Hideyuki; Kashimoto, Masataka; Sakamoto, Chiaki; and Mizutani, Eiji, 4,442,493, Cl. 364-475.000.

Kashiwa, Norio; and Ushida, Yoshihisa, to Mitsui Petrochemical Industries, Ltd. Process for polymerizing or copolymerizing olefins. 4,442,276, Cl. 526-125.000.

Kashiwagi, Hiromi: *See*—
Yamashita, Keitaro; and Kashiwagi, Hiromi, 4,441,636, Cl. 222-541.000.

Kaster, Robert L. Vascular graft. 4,441,215, Cl. 3-1.400.

Kasunic, Keith J.: *See*—
Reeder, Dennis J.; Campbell, John S.; Kasunic, Keith J.; and Laiterman, Lee H., 4,442,524, Cl. 372-107.000.

Kataoka, Yushin; Matsuda, Masaaki; and Kamoda, Masaru, to Sumitomo Chemical Company, Limited. Aminophosphonic acid chelate resin. 4,442,231, Cl. 521-32.000.

Katayama, Masahiro; Yoshida, Nobutoshi; and Kuge, Tsukasa, to Canon Kabushiki Kaisha. Pressure fixing device. 4,441,417, Cl. 100-176.000.

Kato, Tadaaki: *See*—
Maeda, Yuji; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,442,093, Cl. 424-236.000.

Kato, Tomozo. Bonnetless compact design gate valve. 4,441,688, Cl. 251-327.000.

Kato, Tomozo. Bonnetless compact design globe valve. 4,441,689, Cl. 251-366.000.

Katsuaki, Mitani: *See*—
Matsuda, Shunsuke; Ito, Akio; Katsuaki, Mitani; Yoshinobu, Murakami; and Tooru, Tamura, 4,442,061, Cl. 264-328.700.

Kaufman, Martin H., to United States of America, Navy. Nitrile elastomer treating solution and method of treating nitrile elastomer therewith. 4,442,142, Cl. 427-316.000.

Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, to GAO Gesellschaft fur Automation und Organisation mbH. Security document with security features in the form of luminescing substances. 4,442,170, Cl. 428-333.000.

Kawabata, Fumimaru; Shiga, Atsushi; and Yamaguchi, Tadamasa, to Kawasaki Steel Corporation. Four-electrode submerged arc welding process. 4,442,340, Cl. 219-137.0PS.

Kawabata, Nobuaki; Yokoyama, Nobuo; and Araki, Yoshihiko, to Nippon Oil Co. Ltd. Aqueous composition for the protection of paint surfaces. 4,442,140, Cl. 427-154.000.

Kawaguchi, Hiroshi; and Nishina, Shuho, to Toyota Jidosha Kabushiki Kaisha. Foot-operated control device for parking brake. 4,441,380, Cl. 74-512.000.

Kawaguchi, Yoshio: *See*—
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, 4,442,337, Cl. 219-117.100.

Kawahara, Hiroshi: *See*—
Noda, Akinori; Miyasaka, Seiichi; and Kawahara, Hiroshi, 4,442,177, Cl. 428-412.000.

Kawakami, Masamichi, to Koike Sanso Kogyo Co., Ltd. Process and apparatus for exhausting fumes and oxide particles generated by plasma-arc cutting machine. 4,441,934, Cl. 148-9.00R.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nakabayashi, Yasuyuki; Matsura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,441,260, Cl. 34-15.000.

Kawasaki Ksei Chemicals Ltd.: *See*—
Nagaoka, Kazuya; and Yoshii, Sigeru, 4,442,176, Cl. 346-208.000.

Kawasaki Steel Corporation: *See*—
Kawabata, Fumimaru; Shiga, Atsushi; and Yamaguchi, Tadamasa, 4,442,340, Cl. 219-137.0PS.

Kawashima, Syunichiro: *See*—
Ouchi, Hiromu; Kawashima, Syunichiro; Nishida, Masamitsu; and Ueda, Ichiro, 4,442,220, Cl. 501-139.000.

Kazami, Kazuyuki; and Ohtsubo, Yoshiaki, to Nippon Kogaku K.K. Flash device of a camera. 4,441,774, Cl. 315-241.00P.

Keller, Reinhold: *See*—
Prinzbach, Horst; Schwesinger, Reinhard; and Keller, Reinhold, 4,442,299, Cl. 549-545.000.

Kelly, Thomas L. Grid system adhering technique and method of practicing same. 4,441,295, Cl. 52-408.000.

Kemppi Oy: *See*—
Makimaa, Tapani, 4,442,479, Cl. 363-136.000.

Kennecott Corporation: *See*—
TenEyck, John D.; Smith, Russell D.; and Hoff, Kurt W., 4,442,219, Cl. 501-95.000.

Kennedy, Joseph P.; and Frisch, Kurt C., Jr., to University of Akron, The. Cationically polymerizable macromolecular monomers and graft copolymers therefrom. 4,442,261, Cl. 525-324.000.

Kern, Werner, to RCA Corporation. Chemical deposition termination. 4,442,134, Cl. 427-9.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Lieser, Karl H.; and Stojanik, Bernd, 4,442,071, Cl. 423-10.000.

Kerr-McGee Chemical Corporation: *See*—
Rado, Theodore A., 4,442,075, Cl. 423-76.000.

Kessler, Willi: *See*—
Pfeifer, Friedrich; and Kessler, Willi, 4,441,940, Cl. 148-121.000.

Khorsand, Hossein. Print hammer apparatus. 4,441,421, Cl. 101-93.040.

Kiel, Bernd-Joachim: *See*—
Fauck, Gerhard; and Kiel, Bernd-Joachim, 4,441,763, Cl. 303-23.00R.

Kienzle, Frank, to Hoffmann-La Roche Inc. 4-Oxothieno[3,2-d]pyrimidine acetic acid esters. 4,442,289, Cl. 544-280.000.

Kikuchi, Yoshiki; Omori, Takashi; Moriguchi, Haruhiko; Moriguchi, Fujio; and Murayama, Tomio, to Fuji Xerox Co., Ltd. Magnetic recording device. 4,442,441, Cl. 346-74.400.

Killat, Ulrich, to U.S. Philips Corporation. Device for recognizing a binary word. 4,442,550, Cl. 455-608.000.

Kim, Chulho; and Weimer, Raymond J., to United States of America, Navy. Inhomogenous anisotropic kinetic energy penetrators. 4,441,237, Cl. 29-1.200.

Kim, Jong C., to C.V. Chemie Combinatie Amsterdam C.C.A. Light bakery products for diabetics and method for the preparation of these products. 4,442,132, Cl. 426-549.000.

Kimble, James B., to Phillips Petroleum Company. Demetallization of hydrocarbon containing feed streams. 4,441,992, Cl. 208-251.00H.

Kimura, Minoru; and Takeuchi, Bunzi, to Tokyo Shibaura Denki Kabushiki Kaisha. SOS Substrate for semiconductor device. 4,442,178, Cl. 428-446.000.

Kimura, Takashi, to Canon Kabushiki Kaisha. Video recorder/camera having a shared drive. 4,442,462, Cl. 360-33.100.

Kimura, Takeo: *See*—
Shiga, Tetsuo; Kimura, Takeo; Ito, Yoshinobu; Akashi, Kageyasu; Akiyama, Minoru; and Matsui, Takeki, 4,442,202, Cl. 430-600.000.

Kinetics Measurement Corp.: *See*—
Edwards, Raymond A.; and Edwards, Keith F., 4,441,505, Cl. 128-726.000.

King, Jack B.: *See*—
Bouchard, Patrick M.; and King, Jack B., 4,441,475, Cl. 123-525.000.

Kingsley, Richard T.; and Sherman, Larry, to Eastman Kodak Company. Easy open carton. 4,441,612, Cl. 206-620.000.

Kinsbron, Eliezer: *See*—
Alspector, Joshua; Kinsbron, Eliezer; and Sternheim, Marek A., 4,441,249, Cl. 29-577.00C.

Kinugawa Rubber Industrial Co., Ltd.: *See*—
Yamaguchi, Toshiaki, 4,442,156, Cl. 428-142.000.

Kirayoglu, Birol; and Zafiroglu, Dimitri P., to Du Pont de Nemours, E. I., and Company. Woodpulp-polyester spunlaced fabrics. 4,442,161, Cl. 428-219.000.

Kirchkamp, Josef: *See*—
Schulz, Wilhelm; and Kirchkamp, Josef, 4,441,365, Cl. 73-331.000.

Kirk, Arthur G. Marker member. 4,442,152, Cl. 428-77.000.

Kirschensteiner, Fred: *See*—
Hicken, Michael G.; Kirschensteiner, Fred; True, Duane A.; and Taleff, Alexander, 4,441,242, Cl. 29-419.00R.

Kiryu, Rikio; and Bessho, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Gyro stabilization platform for scanning antenna. 4,442,435, Cl. 343-709.000.

Kiss, Gunter H. Process for lining moulded articles and apparatus for performing the process. 4,441,949, Cl. 156-212.000.

Kisz, Gunter H. Apparatus for tucking the edge zone of a surface covering over a supporting edge. 4,441,956, Cl. 156-479.000.

Kissel, Karl-Friedrich: *See—*
Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Fritz, Rolf; and Kissel, Karl-Friedrich, 4,442,066, Cl. 376-302.000.

Kita, Noriyasu: *See—*
Iwaki, Akio; Kita, Noriyasu; Sasazawa, Tatsuya; and Yamaguchi, Hiroyoshi, 4,442,196, Cl. 430-195.000.

Kitajima, Tadayuki; and Kasama, Nobuhiro, to Canon Kabushiki Kaisha. Method and apparatus for image formation utilizing a blocking member for blocking an ion flow through a photosensitive screen to provide a non-image area. 4,442,190, Cl. 430-53.000.

Kitamoto, Tatsuji: *See—*
Dezawa, Shin-ichiro; Akashi, Goro; and Kitamoto, Tatsuji, 4,442,159, Cl. 428-212.000.

Kitao, Kazuhiko: *See—*
Kakeya, Nobuharu; Kitao, Kazuhiko; and Nishimura, Ken-ichi, 4,442,090, Cl. 424-178.000.

Kitao, Shoichi: *See—*
Murata, Michihiro; Kitao, Shoichi; and Okabe, Shinsei, 4,442,422, Cl. 338-35.000.

Kitasato Institute, The: *See—*
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Hashimoto, Takashi; and Shibukawa, Nobuyuki, 4,442,087, Cl. 424-85.000.

Kizaki, Yoshimi: *See—*
Ishiguro, Tomoji; and Kizaki, Yoshimi, 4,441,971, Cl. 204-164.000.

Klamann, Helmut: *See—*
Rau, Wolfgang; Klamann, Helmut; and Hennenberger, Peter, 4,442,271, Cl. 526-61.000.

Klebanoff, Jack L.: *See—*
Childs, Robert H. E., Jr.; Klebanoff, Jack L.; and Pollack, Frederick J., 4,442,484, Cl. 364-200.000.

Klee, David J.; and Nelson, Peter C., to Air Products and Chemicals, Inc. Temperature actuated valve and phase separation method. 4,441,327, Cl. 62-51.000.

Klein, Robert E., to Harris Corporation. Apparatus for reducing aerodynamic drag in system for air cooling a high power vacuum tube. 4,442,373, Cl. 313-35.000.

Kleinschmit, Peter: *See—*
Panster, Peter; and Kleinschmit, Peter, 4,442,040, Cl. 260-429.00R.

Knapp, William; Dunn, William; and Smith, Kent F., to General Instrument Corporation. Storage cells for use in two conductor data column storage logic arrays. 4,442,508, Cl. 365-104.000.

Knesel, Thomas M.: *See—*
Houghton, Alexander J.; and Knasel, Thomas M., 4,441,783, Cl. 350-96.100.

Kneer, Manfred M., to Leviton Manufacturing Company, Inc. Lampsocket mechanism. 4,441,782, Cl. 339-199.00R.

Knorreck, Peter, to Robert Bosch GmbH. Charge-pressure-dependent control apparatus for supercharged fuel-injection engines, in particular for Diesel motor vehicle engines. 4,441,472, Cl. 123-383.000.

Knowles, Philip: *See—*
Ramsden, Christopher A.; Knowles, Philip; Lewis, Edward J.; Lunt, Edward; and Wright, Derek E., 4,442,115, Cl. 424-269.000.

Kobayashi, Akio: *See—*
Isomura, Shigenori; Kodama, Katsuhiko; Kondo, Toshio; and Kobayashi, Akio, 4,441,473, Cl. 123-440.000.

Kobayashi, Masanobu: *See—*
Shirasaki, Shinji; Tsuzuki, Yoshihiko; Hirabayashi, Yuzi; Okazaki, Hiroshi; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,442,424, Cl. 340-52.00F.

Kobayashi, Noboru: *See—*
Sashiki, Takashi; Matsuno, Masaaki; Kobayashi, Noboru; and Mikami, Yoshiharu, 4,441,569, Cl. 177-211.000.

Kobayashi, Yasuhiko: *See—*
Maeda, Yuji; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,442,093, Cl. 424-236.000.

Kochie, Joseph E.: *See—*
Biswas, Bimal K.; and Kochie, Joseph E., 4,441,822, Cl. 366-101.000.

Kodama, Katsuhiko: *See—*
Isomura, Shigenori; Kodama, Katsuhiko; Kondo, Toshio; and Kobayashi, Akio, 4,441,473, Cl. 123-440.000.

Kodera, Masao; and Akita, Sigeyuki, to Nippon Soken, Inc. Ultrasonic wave transmitting and receiving device for vehicles. 4,442,512, Cl. 367-87.000.

Koelmel, Donald F.: *See—*
Shalaby, Shalaby W.; and Koelmel, Donald F., 4,441,496, Cl. 128-335.500.

Koenig & Bauer Aktiengesellschaft: *See—*
Germann, Albrecht J., 4,441,423, Cl. 101-175.000.

Koffee Keeper, Inc.: *See—*
Genuit, James E.; and Cooper, Gary, 4,442,343, Cl. 219-433.000.

Koga, Keiichiro: *See—*
Morokawa, Shigeru; and Koga, Keiichiro, 4,441,826, Cl. 368-204.000.

Koga, Toshiyuki: *See—*
Ishijima, Hiroshi; and Koga, Toshiyuki, 4,442,535, Cl. 378-50.000.

Kogyo Gijutsuin: *See—*
Abe, Toshio; Ishikawa, Hiroshi; and Suhara, Shigeo, 4,441,324, Cl. 60-753.000.

Kohno, Hideki: *See—*
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; Fukino Tadashi; and Yoshida, Minoru, 4,442,360, Cl. 250-486.100.

Kohyama, Mikihiro; and Ohta, Kozo, to Honda Giken Kogyo Kabushiki Kaisha. Rear cover device for motorcycles. 4,441,574, Cl. 180-219.000.

Koichi, Nagai: *See—*
Oshima, Hiroyo; Daisaku, Matsukuma; Yutaka, Kojima; Yukio, Kobayashi; and Koichi, Nagai, 4,442,172, Cl. 428-342.000.

Koike, Masao: *See—*
Niwa, Susumu; and Koike, Masao, 4,442,129, Cl. 426-399.000.

Koike Sanso Kogyo Co., Ltd.: *See—*
Kawakami, Masamichi, 4,441,934, Cl. 148-9.00R.

Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Hashimoto, Takashi; and Shibukawa, Nobuyuki, to Kitasato Institute, The. Interferon inducer, a process for producing the same and pharmaceutical composition containing the same. 4,442,087, Cl. 424-85.000.

Kolar, Cenek; Paulsen, Hans; and Jacquinet, Jean C., to Behringwerke Aktiengesellschaft. Chemical compounds, aminoacid attached to glycoside. 4,442,284, Cl. 536-17.900.

Kolb, Gunter, deceased: *See—*
Probst, Joachim; Riberi, Bernd; Kolb, Gunter, deceased; and Hohlein, Peter, 4,442,145, Cl. 427-385.500.

Kolb, Ingeborg, heiress: *See—*
Probst, Joachim; Riberi, Bernd; Kolb, Gunter, deceased; and Hohlein, Peter, 4,442,145, Cl. 427-385.500.

Kolycheck, Edmond G., to B. F. Goodrich Company, The. Polyurethane covered golf balls. 4,442,282, Cl. 528-83.000.

Komai, Keiichi: *See—*
Nakabayashi, Yasuyuki; Matsura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,441,260, Cl. 34-15.000.

Komura, Tamotsu: *See—*
Tsunekawa, Masayoshi; Yoshida, Shinzo; and Komura, Tamotsu, 4,442,239, Cl. 523-116.000.

Komuro, Katsu: *See—*
Mitsui, Nobuo; Maeda, Yasuyuki; Kurihara, Tomiaki; Shima, Seiya; Hatakeyama, Takanobu; and Komuro, Katsu, 4,441,584, Cl. 187-29.00R.

Kondo, Toshio: *See—*
Isomura, Shigenori; Kodama, Katsuhiko; Kondo, Toshio; and Kobayashi, Akio, 4,441,473, Cl. 123-440.000.

Kongable, Lowell S.; and Bauer, Clint E., to Motorola, Inc. Narrow band digital filter. 4,442,500, Cl. 364-724.000.

Konig, Rainer; Freund, Hans-Ulrich; Heide, Helga; and Sieglen, Rolf A., to International Business Machines Corporation. Process for sorting coarse to fine materials according to their chemical composition. 4,441,616, Cl. 209-44.100.

Konishiroku Photo Industry Co., Ltd.: *See—*
Iwaki, Akio; Kita, Noriyasu; Sasazawa, Tatsuya; and Yamaguchi, Hiroyoshi, 4,442,196, Cl. 430-195.000.
Momose, Haruhiko; Takahashi, Toshiaki; and Hoshino, Yasushi, 4,441,810, Cl. 356-1.000.
Takada, Syun; Kadowaki, Takashi; Okumura, Mitsuhiro; Nakamura, Shinichi; and Iwagaki, Masaru, 4,442,201, Cl. 430-569.000.
Watanabe, Koji; Higuchi, Yoshihiro; Yagi, Michio; and Shiozawa, Kazuo, 4,441,798, Cl. 354-483.000.
Yamamoto, Takeshi; and Goto, Kiyoshi, 4,442,195, Cl. 430-191.000.

Konno, Seishi: *See—*
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Hashimoto, Takashi; and Shibukawa, Nobuyuki, 4,442,087, Cl. 424-85.000.

Kool-Fire Limited: *See—*
VanderVaart, Gerry, 4,441,546, Cl. 165-29.000.

Kool-Stop International Inc.: *See—*
Everett, Richard C., 4,441,592, Cl. 188-264.00A.

Koonce, George R.: *See—*
Pfeifer, George F.; Koonce, George R.; and Phillips, Jack E., 4,442,351, Cl. 250-237.00G.

Koopman, Donald E.: *See—*
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,441,508, Cl. 128-736.000.

Koopmans, Luitzen B. Displaceable winch device. 4,441,690, Cl. 254-279.000.

Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, to Boehringer Ingelheim KG. 1-Aryloxy-3-alkylamino-propan-2-ols. 4,442,120, Cl. 424-282.000.

Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, to Boehringer Ingelheim K.G. 1-Aryloxy-3-alkinylamino-propan-2-ols. 4,442,121, Cl. 424-282.000.

Korth, Hans-Erdmann, to International Business Machines Corporation. Paraboloidal coupler for light wave guides. 4,441,784, Cl. 350-96.150.

Korzaniewski, Mark M. Weight lifting type exercising device. 4,441,706, Cl. 272-118.000.

Kosa, Bruce G., to Rogers Corporation. Nylon foam. 4,442,234, Cl. 521-112.000.

Kosmoski, Jeffrey P., to McDonnell Douglas Corporation. Foot actuated latch. 4,441,842, Cl. 410-81.000.

Kosugi, Masao, to Canon Kabushiki Kaisha. Disc orienting device. 4,441,853, Cl. 414-757.000.

Kotani, Shintaro; Abiko, Ichimatsu; Arae, Takashi; Chiba, Mio; Araki, Tomoo; and Kanno, Hiromasa, to Oki Electric Industry Co., Ltd. Display apparatus utilizing a thermally color reversible display medium which has a hysteresis effect. 4,442,429, Cl. 340-786.000.

Kotsifas, Peter N.; Wetzel, Victor H.; and Gilson, Richard W., to Sherwood Medical Company. Endometrial sampling device. 4,441,509, Cl. 128-757.000.

Kovaleski, Joseph J., to Wyrepak Industries, Inc. Rubber-lagged sheave. 4,441,692, Cl. 254-390.000.

Kovan Engineering Pty. Ltd.: *See*—
Anderson, Michael P., 4,441,393, Cl. 83-360.000.

Kowa Shoji Kabushiki Kaisha: *See*—
Mori, Kashichi, 4,441,413, Cl. 99-542.000.

Krallmann, Reinhold: *See*—
Hartwig, Ernst; and Krallmann, Reinhold, 4,442,287, Cl. 544-187.000.

Kramer, Charles F., to Steel Heddle Manufacturing Company. Stabilized shuttle grip. 4,441,529, Cl. 139-207.000.

Kramer Industries, Inc.: *See*—
Most, Ivan G.; and Hubble, William S., 4,441,922, Cl. 75-25.000.

Kramer, Ted J.: *See*—
Franklin, James L.; and Kramer, Ted J., 4,442,475, Cl. 361-383.000.

Kratt, Alfred; Kraus, Bernd; and Plapp, Gunther, to Robert Bosch GmbH. Apparatus for regulating the idling rpm of internal combustion engines. 4,441,471, Cl. 123-339.000.

Kraus, Bernd: *See*—
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Kreiner, Hans-Jurg, to Munchener Apparatebau fur elektronische Ger/e Kimmel GmbH. Apparatus for detecting α-rays present in a specified energy range. 4,442,358, Cl. 250-435.000.

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Kropp, Lev: *See*—
Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., 4,441,406, Cl. 99-275.000.

Kubie, Jan: *See*—
Boutin, Francois-Regis; and Kubie, Jan, 4,441,933, Cl. 148-2.000.

Kubis, Heribert; and Schott, Karl, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Oil pump arrangement. 4,441,866, Cl. 417-364.000.

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Kubo, Yutaka: *See*—
Ota, Hideo; and Kubo, Yutaka, 4,442,485, Cl. 364-200.000.

Kubota Ltd.: *See*—
Hiraishi, Hisashi; Yamakami, Yoshiaki; and Shintani, Atsunobu, 4,441,926, Cl. 75-128.00A.
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,442,068, Cl. 420-584.000.

Kuester, Frank E., to Brunswick Corporation. Chemical and biological resistant material and method of fabricating same. 4,442,162, Cl. 428-245.000.

Kuge, Tsukasa: *See*—
Katayama, Masahiro; Yoshida, Nobutoshi; and Kuge, Tsukasa, 4,441,417, Cl. 100-176.000.

Kughn, Richard P.: *See*—
Buehrig, Gordon M., 4,441,752, Cl. 296-1.00S.

Kuhn, John B., to Deere & Company. Implement working height-adjustment mechanism. 4,441,306, Cl. 56-15.900.

Kuhnel, Werner: *See*—
Baumann, Heinz; Kuhnel, Werner; and Rattner, Manfred, 4,442,483, Cl. 363-131.000.

Kuhner, Gerhard; Wolff, Siegfried; and Rothbuhr, Lothar, to Degussa Aktiengesellschaft. Resorcinol-filler preparation, process for the production and use of the same. 4,442,163, Cl. 428-262.000.

Kuhr, Manfred: *See*—
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,442,033, Cl. 260-158.000.

Kumar, Ananda H., to International Business Machines Corporation. Maskless coating of metallurgical features of a dielectric substrate. 4,442,137, Cl. 427-57.000.

Kumar, Kaplesh; and Das, Dilip K., to Charles Stark Draper Laboratory, Inc., The. Apparatus for differential expansion volume compaction. 4,441,874, Cl. 425-78.000.

Kummer, David A.: *See*—
Dean, Mark E.; Kummer, David A.; and Saenz, Jesus A., 4,442,428, Cl. 340-703.000.

Kummer, Werner: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,442,120, Cl. 424-282.000.
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Kumpe, Gerhardt: *See*—
Heber, Helmut; Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Schick, Manfred, 4,442,213, Cl. 435-217.000.

Kunz, Walter; Eckhardt, Wolfgang; Hubele, Adolf; and Riebli, Peter, to Ciba-Geigy Corporation. Homoserine derivatives and their use as microbicides. 4,442,117, Cl. 424-273.00R.

Kupisiewicz, Stefan; and Schoebrechts, Jacques J. F. Rotating electrical machine. 4,442,368, Cl. 310-201.000.

Kuramochi, Koujiro: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,441,594, Cl. 192-3.280.

Kurashima, Hideo. Decorative cufflink. 4,441,234, Cl. 24-41.000.

Kurashima, Hideo: *See*—
Shibasaki, Kyuichi; and Kurashima, Hideo, 4,441,813, Cl. 356-237.000.

Kurata, Masami; Moriguchi, Fujio; Ohmori, Takashi; and Makino, Katsuo, to Fuji Xerox Co., Ltd. Two-color copying machine. 4,442,452, Cl. 358-75.000.

Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Murayama, Tomio, to Fuji Xerox Co., Ltd. Copying machine. 4,442,460, Cl. 358-296.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Maeda, Yuji; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,442,093, Cl. 424-236.000.
Yusa, Haruhiko; Hoshino, Mitsuru; Kurosaki, Akira; Furusawa, Hironobu; and Sugitawa, Chikara, 4,442,262, Cl. 525-69.000.

Kurihara, Masaki, to Clarion Co., Ltd. Direction-variable speaker system. 4,441,577, Cl. 181-147.000.

Kurihara, Michio: *See*—
Nakabayashi, Yasuyuki; Matsura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,441,260, Cl. 34-15.000.

Kurihara, Tomiaki: *See*—
Mitsui, Nobuo; Maeda, Yasuyuki; Kurihara, Tomiaki; Shima, Seiya; Hatakeyama, Takanobu; and Komuro, Katsu, 4,441,584, Cl. 187-29.00R.

Kurnit, Norman A.: *See*—
Brau, Charles A.; Kurnit, Norman A.; and Cooper, Richard K., 4,442,522, Cl. 372-2.000.

Kurokawa, Yoshiki: *See*—
Hotta, Teruyuki; Kurokawa, Yoshiki; Nagasaku, Eiichi; and Yasunaga, Masao, 4,441,863, Cl. 417-281.000.

Kurosaki, Akira: *See*—
Yusa, Haruhiko; Hoshino, Mitsuru; Kurosaki, Akira; Furusawa, Hironobu; and Sugitawa, Chikara, 4,442,262, Cl. 525-69.000.

Kurpershoek, Cornelis, to Industri AB Thule. Attachment means provided with a lock. 4,441,344, Cl. 70-231.000.

Kusayama, Masahiro, to Yoshida Kogyo K. K. Slide fastener with bottom stop. 4,441,235, Cl. 433-001.000.

Kuwakado, Satosi: *See*—
Tsuge, Noboru; Shimogawa, Toshiaki; Kuwakado, Satosi; and Takei, Toshihiro, 4,441,738, Cl. 280-806.000.

Kvapil, Rudolf: *See*—
Hutchins, Ned M.; Studebaker, Irving G.; Kvapil, Rudolf; and Ricketts, Thomas E., 4,441,759, Cl. 299-2.000.

Kydd, Paul H., to HRI Inc. Polypeptides as chemical tagging materials. 4,441,943, Cl. 149-109.400.

Kyoto Yakuhin Kogyo Kabushiki Kaisha: *See*—
Kakeya, Nobuharu; Kitao, Kazuhiko; and Nishimura, Ken-ichi, 4,442,090, Cl. 424-178.000.

Kyushima, Tatsuo: *See*—
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Laakso, Oliver A. Method of continuously treating a fibrous suspension. 4,441,224, Cl. 8-156.000.

LaBate, Micheal D. Blast furnace trough and liner combination. 4,441,700, Cl. 266-281.000.

Laboratoire Roger Bellon: *See*—
Ichihashi, Hitoshi; Tanaka, Terukazu; and Imasato, Yu, 4,442,101, Cl. 424-250.000.

Laboratoires Sobio S.A. of Immeuble Perisud: *See*—
Le Polles, Jean-Bernard; Martin, Michel; Nadler, Guy; and Saias, Edmond, 4,442,108, Cl. 424-258.000.

Lacaze, Albert: *See*—
Bon-Mardion, Gilbert; Claudet, Gerard; and Lacaze, Albert, 4,441,325, Cl. 62-3.000.

La Dow, William R.: *See*—
Cummings, Charles A.; and La Dow, William R., 4,441,256, Cl. 33-27.00L.

Laiterman, Lee H.: *See*—
Reeder, Dennis J.; Campbell, John S.; Kasunic, Keith J.; and Laiterman, Lee H., 4,442,524, Cl. 372-107.000.

Lajovic, Dusan S. Printing apparatus. 4,441,426, Cl. 101-376.000.

Lamarche, Paul E., to Borg-Warner Corporation. Hydraulic pressure relief valve for lock-up clutch. 4,441,595, Cl. 192-3.290.

Lange, Dietmar: *See*—
Limque, Ferdinand; Luiten, Cornelis H.; Bless, Franz; Neubauer, Reinhard; and Lange, Dietmar, 4,441,698, Cl. 266-249.000.

Langen, Marinus J. M., to H. J. Langen & Sons Limited. Carton-closing machine. 4,441,303, Cl. 53-374.000.

Langer, Arthur W., Jr., to Exxon Reserch and Engineering Co. Preparation of linear olefin products. 4,442,309, Cl. 585-523.000.

Lanuke, Edward W.: *See*—
Carlson, Norman R.; Roesner, Raymond E.; and Lanuke, Edward W., 4,441,361, Cl. 73-155.000.

Lapshin, Boris G.: *See*—
Meer, Vadim V.; Nesterov, Vladimir I.; and Lapshin, Boris G., 4,442,511, Cl. 367-78.000.

Larkin, Mark E.; and Meyer, Leonard J., to Abbott Laboratories. Flexible container with integral ports and diaphragm. 4,441,538, Cl. 604-415.000.

Larsen, Howland A., to Du Pont de Nemours, E. I., and Company. Preparation of salt solution useful for making nylon. 4,442,260, Cl. 524-845.000.

Larsen, Thor; and Samdal, Terje. Power conversion machine having a nutating piston. 4,441,869, Cl. 418-51.000.

Larus Corporation: *See*—
McDermott, Noel C., 4,442,325, Cl. 179-190.000.

Lassen, Joergen B.; Skrumsager, Birte K.; and Christensen, Joergen A., to A/S Ferrosan. Long-term weight reduction of obese patients using femoxetine. 4,442,113, Cl. 424-267.000.

Latter, Albert L.; Hammond, R. Philip; and Dooley, James L., to R & D Associates. Retrofittable nuclear reactor core catcher. 4,442,065, Cl. 376-280.000.

Lauterbach-Dammler, Inge: *See*—
Zolner, Dieter H.; Rittmann, Friedrich; Dung, Herbert; Haremsa, Johannes; Bauer, Georg; Otto, Josef; Muhlenbeck, Josef; and Lauterbach-Dammler, Inge, 4,442,525, Cl. 373-93.000.

Lawrence Fell Limited: *See*—
Takeuchi, Seiji, 4,441,627, Cl. 220-461.000.

Lay, Larry D. Bowling ramp attachment for wheelchairs. 4,441,710, Cl. 273-54.00R.

Le, Trung, to International Business Machines Corporation. Differential amplifier with auto bias adjust. 4,442,408, Cl. 330-261.000.

Lear Siegler, Inc.: *See*—
Bowman, Clyde L.; DeVries, Charles R.; and Saur, Charles W., 4,441,607, Cl. 198-781.000.

Lebrun, Philippe; and de Saint Georges-Gridelet, Daniele, to Gist-Brocades N.V. Process for combatting and/or preventing allergic diseases employing natamycin. 4,442,091, Cl. 424-181.000.

Lederer, David B., to Detection Systems, Inc. Multiple field-of-view optical system. 4,442,359, Cl. 250-342.000.

Ledex, Inc.: *See*—
Myers, John L., 4,442,418, Cl. 335-230.000.

Lee, Gim F., Jr.: *See*—
Haaf, William R.; Lee, Gim F., Jr.; and Ting, Sei P., 4,442,251, Cl. 524-141.000.

Lee, John M.; Baumen, William C.; Wolcott, Richard A.; and Burba, John L., III, to Dow Chemical Company, The. Higher density ion exchange resins of metal compound precipitated within pores. 4,442,230, Cl. 521-28.000.

Lee, Julia L.: *See*—
Crivello, James V.; and Lee, Julia L., 4,442,197, Cl. 430-280.000.

Lees, Gerard D.; and Causby, Barry D., to Fiber Industries, Inc. Partially oriented polyester yarn finish. 4,442,249, Cl. 523-455.000.

Lehmann, William L., to RCA Corporation. Television receiver tuning circuit tunable over a wide frequency range. 4,442,548, Cl. 455-195.000.

Lehrer, William I.; and Deal, Bruce E., to Fairchild Camera and Instrument Corp. Binary germanium-silicon interconnect and electrode structure for integrated circuits. 4,442,449, Cl. 357-67.000.

Leifeld, Ferdinand: *See*—
Beneke, Wolfgang; and Leifeld, Ferdinand, 4,441,994, Cl. 209-139.00R.

Leiper, Fred B., to Hardware Designers, Inc. Bottom mounted drawer slide assembly. 4,441,773, Cl. 312-330.00R.

Leiper, Fred S.: *See*—
Fielding, Brian S.; and Leiper, Fred S., 4,441,772, Cl. 312-330.00R.

Leitermann, Alfred; and Mason, Gary B. Method, and means, for in situ determination of alignment of a vehicle frame. 4,441,259, Cl. 33-288.000.

Leland Stanford Jr. University, Board of Trustees of: *See*—
Pounds, Douglas W., 4,441,486, Cl. 128-24.00A.

LeMaitre, Patrick: *See*—
Hulin, Jean P.; Bouvard, Andre; and LeMaitre, Patrick, 4,441,786, Cl. 350-96.210.

Lemkey, Franklin D.; and Thompson, Earl R., to United Technologies Corporation. M_7C_3Reinforced iron base superalloys. 4,441,939, Cl. 148-31.000.

Lenarth, Edward L.: *See*—
Roberts, James E.; and Lenarth, Edward L., 4,441,476, Cl. 123-542.000.

Lenderking, Bruce N.; and Bocklage, Casper J., Jr., to Westinghouse Electric Corp. Versatile printed circuit board termination rack. 4,442,476, Cl. 361-395.000.

Lenker, Jay A.: *See*—
Ionescu, Marian I.; Lenker, Jay A.; and Rosenbluth, Robert F., 4,441,216, Cl. 3-1.500.

Lenz, Hermann: *See*—
Bernauer, Otto; Holzt, Hans-Peter; and Lenz, Hermann, 4,441,326, Cl. 62-7.000.

Leonard, Edward F., to Procter & Gamble Company, The. Articulated fabric formed by self-assembling fibers. 4,441,947, Cl. 156-158.000.

Leonard, Murray: *See*—
Rickman, Mark A.; and Leonard, Murray, 4,441,480, Cl. 126-42.000.

Lepisto, J. George: *See*—
Hain, Paul O.; and Lepisto, J. George, 4,441,613, Cl. 206-621.000.

Le Polles, Jean-Bernard; Martin, Michel; Nadler, Guy; and Saias, Edmond, to Laboratoires Sobio S.A. of Immeuble Perisud. Hydrogenated isoquinolines and peripheral vascular disease treating compositions thereof. 4,442,108, Cl. 424-258.000.

Lescovich, Joseph E.: *See*—
Salina, Louis E.; and Lescovich, Joseph E., 4,442,395, Cl. 320-48.000.

Lescrenier, Charles. Image plane indicator. 4,442,533, Cl. 378-21.000.

Lesquereux, Pierre-Andre: *See*—
Lesquereux, Yvan; and Lesquereux, Pierre-Andre, 4,442,341, Cl. 219-201.000.

Lesquereux, Yvan; and Lesquereux, Pierre-Andre. Electric antifreeze heating device for lock cylinders and mounting arrangement therefor. 4,442,341, Cl. 219-201.000.

Lessard, Dennis E.; and Sabourin, Paul F., to General Electric Company. Ultrasonic detection of extended flaws. 4,441,369, Cl. 73-602.000.

Leszkiewicz, Edmund E. Swimming spoon lure. 4,441,275, Cl. 43-42.060.

Leupold, Ernst I.; Schmidt, Hans-Joachim; Wunder, Friedrich; Arpe, Hans-Jurgen; and Hachenberg, Horst, to Hoechst Aktiengesellschaft. Process for the manufacture of ethanol from synthesis gas. 4,442,228, Cl. 518-714.000.

Levai, Laslo: *See*—
Wimmer, Robert; and Levai, Laslo, 4,441,737, Cl. 280-804.000.

Lever Brothers Company: *See*—
Ruppert, Ronald M.; and Padron, Tamara, 4,441,881, Cl. 8-137.000.

Levin, Rafael M., to Bell Telephone Laboratories, Incorporated. Method of making self-aligned guard regions for semiconductor device elements. 4,441,931, Cl. 148-1.500.

Levine, Lewis J.: *See*—
Hebert, Raymond A., Jr.; Levine, Lewis J.; and Shipp, Kenneth O., Jr., 4,441,829, Cl. 400-63.000.

Leviton Manufacturing Company, Inc.: *See*—
Kneer, Manfred M., 4,441,782, Cl. 339-199.00R.

Lew, Hyok S. Variable camber fluid power machine. 4,441,858, Cl. 416-17.000.

Lewis, Edward J.: *See*—
Ramsden, Christopher A.; Knowles, Philip; Lewis, Edward J.; Lunt, Edward; and Wright, Derek E., 4,442,115, Cl. 424-269.000.

Lewis, Robert M.; Ryan, Robert C.; and Slaugh, Lynn H., to Shell Oil Company. Conversion of dimethyl ether to formaldehyde using Bi-Mo-Fe catalyst. 4,442,307, Cl. 568-470.000.

Lewis, Shelton E.: *See*—
Richardson, Bryan D.; and Lewis, Shelton E., 4,441,955, Cl. 156-423.000.

Li, Yao T. Distillation apparatus. 4,441,963, Cl. 202-172.000.

Libit, Sidney M. Dispensing type cap closure. 4,441,637, Cl. 222-556.000.

Lichtenberger, Rosemary K., to Cooper Industries, Inc. Fiber optic cable and method of manufacture. 4,441,787, Cl. 350-96.230.

Lieser, Karl H.; and Stojanik, Bernd, to Kernforschungszentrum Karlsruhe GmbH. Extraction of plutonium ions from aqueous sulfuric acid solutions with D_2EHPA or $D_2EHPA/TOPO$. 4,442,071, Cl. 423-10.000.

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Hulin, Jean P.; Bouvard, Andre; and LeMaitre, Patrick, 4,441,786, Cl. 350-96.210.

Likins, Merle R., Jr.; and Stacy, Galen D., to Phillips Petroleum Company. Carbon black furnace apparatus. 4,442,069, Cl. 422-62.000.

Liljekvist, Bernt S., to Santrade Ltd. Guiding device for percussion drills. 4,441,565, Cl. 175-325.000.

Lilly Industries Limited: *See*—
Simmonds, Robin G., 4,442,032, Cl. 260-149.000.

Lim, Drahoslav, to Barnes-Hind/Hydrocurve, Inc. Treatment of cellulose acetate butyrate contact lenses. 4,442,141, Cl. 427-164.000.

Limousin, Louis. Nesting modular elements, and their method of assembly. 4,441,298, Cl. 52-594.000.

Limque, Ferdinand; Luiten, Cornelis H.; Bless, Franz; Neubauer, Reinhard; and Lange, Dietmar, to Limque, Ferdinand. Furnace for the heat treatment of drills. 4,441,698, Cl. 266-249.000.

Lin, Meei H., Executrix: *See*—
Lin, Ta-Tung, deceased; Lin, Meei H., Executrix; and Fedde, George A., 4,442,542, Cl. 382-8.000.

Lin, Ta-Tung, deceased; by Lin, Meei H., Executrix; and Fedde, George A., to Sperry Corporation. Preprocessing circuitry apparatus for digital data. 4,442,542, Cl. 382-8.000.

Lindbom, Torsten H., to Unimation, Inc. Safe programming system for industrial robots. 4,442,387, Cl. 318-568.000.

Linde Aktiengesellschaft: *See*—
Breider, Edmund J., 4,442,005, Cl. 210-614.000.

Lindner, Friedrich; and Scheunemann, Kurt, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt E.V. Increasing the cycle stability of a sodium sulfate heat exchange medium by adding sulfuric acid. 4,442,016, Cl. 252-70.000.

Liou, Tony; and Wang, Richard, to Collins Company, Ltd. Lounge chair with improved arm rests. 4,441,756, Cl. 297-39.000.

Lippl, Wilhelm, to Karl Mengele & Sohne GmbH & Co. Multi-row corn cutter forage harvester and/or corn picker forage harvester. 4,441,305, Cl. 56-15.600.

Lipschutz, Lewis D.; Meagher, Ralph E.; and Presti, Frank P., to International Business Machines Corporation. Cooling element for solder bonded semiconductor devices. 4,442,450, Cl. 357-81.000.

Liquid Carbonic Inc.: *See*—
Reed, Gordon A. D., 4,442,143, Cl. 427-340.000.

Livingston, William T.: *See*—
McKelvey, Harold E.; Livingston, William T.; and Sheldon, Edward D., 4,441,909, Cl. 65-273.000.

Lobdell, Alban J., to Camelot Industries Corporation. Molded multifocal lens and mold assembly. 4,441,795, Cl. 351-169.000.

Lockett, Roger A.: *See*—
Baker, Geoffrey; and Lockett, Roger A., 4,442,357, Cl. 250-338.000.

Lockwood International B.V.: *See*—
Douwenga, Rudolf, 4,441,304, Cl. 53-568.000.

Loctite (Ireland) Limited: *See*—
Charnock, Ronald S., 4,442,267, Cl. 525-309.000.

Lohmar, Ernst; and Wenneis, Wolffried, to Carl Freudenberg, Firma. Method for the manufacture of cross-linked and optionally foamed polypropylene. 4,442,233, Cl. 521-98.000.

Lohr, Raymond J. Balloon game. 4,441,719, Cl. 273-402.000.

Lolli, Carla P. Universal file with inner gluing back for thermal gluing systems. 4,441,950, Cl. 156-216.000.

Long, John V.: *See*—
Gagliani, John; and Long, John V., 4,442,283, Cl. 528-323.000.

Looney, James R.; and McDougall, Lee A., to Exxon Research & Engineering Co. Use of esters of sulfonic acids as anti-sludge agents during the acidizing of formations containing sludging crude oils. 4,442,014, Cl. 252-8.55C.

Lork, Winfried: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,442,304, Cl. 560-232.000.

Lottick, Edward A. Non-spillable drinking container. 4,441,640, Cl. 224-252.000.

Lougheed, Robert M.: *See*—
Sternberg, Stanley R.; and Lougheed, Robert M., 4,442,543, Cl. 382-49.000.

Lower, Ralph C.; and Shirley, Roger D., to Robinair Manufacturing Corporation. Refrigerant recovery and recharging system. 4,441,330, Cl. 62-149.000.

Lowry, Gary H.; and Simmons, John A. Teat cup stopper. 4,441,455, Cl. 119-14.470.

Lu, Chin H.; and AuClair, Christopher J., to Xerox Corporation. Toner compositions containing polyanhydride resins. 4,442,189, Cl. 430-45.000.

Luarel Bank Machine Co., Ltd.: *See*—
Uchida, Isamu; and Imamura, Yoshiyuki, 4,441,704, Cl. 271-303.000.

Lucas, Eugene F.: *See*—
Carman, Vincent E.; Anderson, David H.; and Lucas, Eugene F., 4,441,573, Cl. 180-165.000.

Lucas Industries Limited: *See*—
Cockshott, Charles P.; and Evans, Kenneth S., 4,441,371, Cl. 73-861.090.
Jarrett, Boaz A.; and Mowbray, Dorian F., 4,441,474, Cl. 123-450.000.

Lucht Engineering, Inc.: *See*—
Bartz, Stephen A., 4,441,807, Cl. 355-40.000.

Ludwick, Sandra L.; Pond, Stanley L.; and Rhodes, Robert T., to International Business Machines Corporation. Corona wire assembly and method. 4,442,356, Cl. 250-324.000.

Luiten, Cornelis H.: *See*—
Limque, Ferdinand; Luiten, Cornelis H.; Biess, Franz; Neubauer, Reinhard; and Lange, Dietmar, 4,441,698, Cl. 266-249.000.

Lundberg, Robert D.; Thaler, Warren A.; and Agarwal, Pawan K., to Exxon Research and Engineering Co. Blend compounds of sulfonated polymers and compositions thereof. 4,442,253, Cl. 524-211.000.

Lundberg, Robert D.: *See*—
Thaler, Warren A.; Walker, Thad O.; Lundberg, Robert D.; and Wagensommer, Joseph, 4,442,011, Cl. 252-8.50M.

Lunt, Edward: *See*—
Ramsden, Christopher A.; Knowles, Philip; Lewis, Edward J.; Lunt, Edward; and Wright, Derek E., 4,442,115, Cl. 424-269.000.

Luscombe, Terry L. Fireplace insert. 4,441,482, Cl. 126-123.000.

Lux, Werner; Vahlensieck, Jurgen; Zell, Jakob; Hermann, Bodo; Bartsch, Heinz; and Zimmermann, Horst, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Device for feeding welding wire in a submerged arc welding operation. 4,442,334, Cl. 219-73.000.

Lyon, Harry H.: *See*—
Bruso, Frederick G.; Walker, Frank H.; and Lyon, Harry H., 4,441,520, Cl. 137-44.000.

Lyons, James E.: *See*—
Hsu, Chao-Yang; and Lyons, James E., 4,442,036, Cl. 260-396.00R.

M.A.N. Maschinenfabrik Augsburg-Nurnberg: *See*—
Wagner, Ulrich; and Buschulte, Winfried, 4,441,879, Cl. 431-284.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Kubis, Heribert; and Schott, Karl, 4,441,866, Cl. 417-364.000.
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M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Heckler, Hatto; Petersen, Godber; and Frick, Alfons, 4,441,390, Cl. 83-154.000.

Macabee, David K.: *See*—
Macabee, L. Cedric, 4,441,488, Cl. 128-66.000.

Macabee, L. Cedric, to Macabee, David K. Hydro-air vibrator massage apparatus. 4,441,488, Cl. 128-66.000.

Maccarinelli, Edoardo. Machine for forming prefabricated building components. 4,441,873, Cl. 425-64.000.

MacDiarmid, Alan G.; Heeger, Alan J.; and Nigrey, Paul J., to University Patents, Inc. Batteries having conjugated polymer electrodes. 4,442,187, Cl. 429-213.000.

MacGregor International, S.A.: *See*—
Biaggi, Jacques, 4,441,449, Cl. 114-263.000.

Machine Design Incorporated: *See*—
Quantz, James B., 4,441,414, Cl. 99-571.000.

Mackal, Glenn H. Compressed gas powered caulking gun. 4,441,629, Cl. 222-324.000.

Mackinnon, John W. M.: *See*—
Clitherow, John W.; Bradshaw, John; Mackinnon, John W. M.; Price, Barry J.; Martin-Smith, Michael; and Judd, Duncan B., 4,442,110, Cl. 424-263.000.

MacMillan Bloedel Limited: *See*—
Gillard, David F.; and Yelf, Jack T., 4,441,948, Cl. 156-189.000.

Macnab, John E., to Towmotor Corporation. Lift mast assembly. 4,441,585, Cl. 187-95.000.

Maeda, Tetsuji: *See*—
Kajimura, Mutsuhiko; and Maeda, Tetsuji, 4,442,232, Cl. 521-56.000.

Maeda, Yasuyuki: *See*—
Mitsui, Nobuo; Maeda, Yasuyuki; Kurihara, Tomiaki; Shima, Seiya; Hatakeyama, Takanobu; and Komuro, Katsu, 4,441,584, Cl. 187-29.00R.

Maeda, Yuji; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for administering 24,25-dihydroxycholecalciferol to persons suffering from hypercalcemia. 4,442,093, Cl. 424-236.000.

Maejima, Masaaki: *See*—
Kanoi, Minoru; Hori, Yasuro; and Maejima, Masaaki, 4,442,419, Cl. 336-100.000.

Maekawa, Hitoshi; Osawa, Michitaka; and Ando, Kunio, to Hitachi, Ltd. Horizontal deflection circuit. 4,442,384, Cl. 315-399.000.

Magarian, Robert A.; and Pento, Joseph T., to University of Oklahoma, The Board of Regents for the. Cyclopropyl analogs and estrogenic as anti-fertility agents. 4,442,119, Cl. 424-274.000.

Maggio, Michael J.: *See*—
Getz, Marlyn F.; Maggio, Michael J.; and Hitch, Billy F., 4,441,927, Cl. 75-229.000.

Main, William E., to Motorola, Inc. Meter drive circuit. 4,442,549, Cl. 455-211.000.

Makimaa, Tapani, to Kemppi Oy. Inverter with saturable reactor protection circuit. 4,442,479, Cl. 363-136.000.

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Kurata, Masami; Moriguchi, Fujio; Ohmori, Takashi; and Makino, Katsuo, 4,442,452, Cl. 358-75.000.

Malard, Marcel: *See*—
Huignard, Jean P.; and Malard, Marcel, 4,442,455, Cl. 358-209.000.

Malik, Roger J.; and AuCoin, Thomas R., to United States of America, Army. Planar doped barrier gate field effect transistor. 4,442,445, Cl. 357-22.000.

Malivoir, Roger; and Mayer, Gilbert, to Pont-a-Mousson SA. Method and apparatus for producing bundles of cast iron pipes. 4,441,847, Cl. 414-31.000.

Malkowski, Joseph L.; and Wells, Calvin G., to Rockwell International Corporation. Interlock device for a transmission shift mechanism. 4,441,379, Cl. 74-477.000.

Malmendier, Joseph W.; Pride, Carol F.; Rhoads, Randy L.; Schlaufman, Robert J.; and Shoup, Robert D., to Corning Glass Works. Method of forming ceramic bodies. 4,441,905, Cl. 65-21.300.

Mancini, Derek V., to Consumers Glass Company Limited. Container chute for fast reception of nested containers. 4,441,618, Cl. 211-49.00D.

Manion, Francis M.: *See*—
Tippetts, Thomas B.; and Manion, Francis M., 4,441,525, Cl. 137-814.000.

Mannesmann AG: *See*—
Damm, Horst; and Pfordt, Hartwig, 4,441,570, Cl. 180-9.620.

Manor, Henry A., to Balmar Crimp Tool Corp. Hand tool linkage. 4,441,388, Cl. 81-300.000.

Manoury, Philippe: *See*—
Beeley, Nigel R. A.; Cremer, Gerard; Dimsdale, Michael J.; and Manoury, Philippe, 4,442,126, Cl. 424-324.000.

Marc, Michel. Flow molding. 4,441,876, Cl. 425-174.80E.

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Marciandi, Franco; and Relvini, Pasquale, to Montedison S.p.A. Self-extinguishing polyolefinic compositions. 4,442,255, Cl. 524-414.000.

Margaret's Fine Food Ltd.: *See*—
Nagy, Alex J.; and Reed, William G., 4,442,131, Cl. 426-518.000.

Marin, Robert A.: *See*—
Cloud, Nathan; Marin, Robert A.; and McErlane, James E., 4,441,660, Cl. 242-35.50A.

Mark, Seymour, to Gulf & Western Industries, Inc. Coal-aqueous mixtures. 4,441,889, Cl. 44-51.000.

Marklund, Olle E. Arrangement in drum mills. 4,441,659, Cl. 241-70.000.

Marks, Alvin M. Electroordered dipole suspension. 4,442,019, Cl. 252-309.000.

Marquarding, Dieter; and Aigner, Helmut. Process for the preparation of acid amides and application of the process. 4,442,029, Cl. 260-112.50R.

Marquardt GmbH: *See*—
Schaffeler, Alois, 4,442,328, Cl. 200-76.000.

Marquart, Vernon W.; and Pawlikowski, Walter W., to Minnesota Mining and Manufacturing Company. Dust mop. 4,441,228, Cl. 15-229.0BP.

Martensson, Anders K.: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,441,591, Cl. 188-202.000.

Martin, Frank A.: *See*—
Carter, William A.; and Martin, Frank A., 4,441,975, Cl. 204-206.000.

Martin, Ivan E.: *See*—
Trumble, William P.; Martin, Ivan E.; and Berthiaume, Clement E., 4,441,213, Cl. 2-161.00R.

Martin, Joel L., to Phillips Petroleum Company. Polymerization process using catalyst having aqueous titanation of support with solubilized $Ti(OR)_4$. 4,442,275, Cl. 526-96.000.

Martin, Joel L., to Phillips Petroleum Company. Process and catalyst for olefin polymerization. 4,442,277, Cl. 526-125.000.

Martin Marietta Corporation: *See*—
Tobey, William H., 4,441,376, Cl. 74-89.150.

Martin, Michel: *See*—
Le Polles, Jean-Bernard; Martin, Michel; Nadler, Guy; and Saias, Edmond, 4,442,108, Cl. 424-258.000.

Martin-Smith, Michael: *See*—
Clitherow, John W.; Bradshaw, John; Mackinnon, John W. M.; Price, Barry J.; Martin-Smith, Michael; and Judd, Duncan B., 4,442,110, Cl. 424-263.000.

Martinka, Michael: *See*—
Pohlmann, Juergen L. W.; and Martinka, Michael, 4,441,967, Cl. 204-29.000.

Martner, John G., to Exxon Research and Engineering Co. Apparatus and method to eject ink droplets on demand. 4,442,443, Cl. 346-140.00R.

Maruyama, Yuji; and Horinishi, Katsumi, to West Electric Co., Ltd. Electronic flash device capable of automatically controlling the quantity of a flash of light. 4,441,797, Cl. 354-416.000.

Marx, Hans-Norbert; and Gottsche, Reimer, to BASF Aktiengesellschaft. Fireproofing composition and door rabbet coated therewith. 4,442,157, Cl. 428-173.000.

Masaru, Fujimura: *See*—
Ikuo, Yamaguchi; Yasuo, Higashibata; and Masaru, Fujimura, 4,441,289, Cl. 52-167.000.

Maschinenfabrik Hennecke GmbH: *See*—
Proksa, Ferdinand; Sulzbach, Hans-Michael; and Raffel, Reiner, 4,442,070, Cl. 422-133.000.

Mashimo, Yukio; and Iwashita, Tomonori, to Canon Kabushiki Kaisha. Motor driven camera. 4,441,801, Cl. 354-173.110.

Mason, Gary B.: *See*—
Leitermann, Alfred; and Mason, Gary B., 4,441,259, Cl. 33-288.000.

Mason, Stuart V., to Forster, Paul. Airfoils for land vehicles. 4,441,753, Cl. 296-1.00S.

Massachusetts Institute of Technology: *See*—
Fan, John C. C., 4,442,166, Cl. 428-323.000.
Varshavsky, Alexander J., 4,442,203, Cl. 435-6.000.

Massey, David H., to PMP Corporation. Building board composition and method of making same. 4,441,944, Cl. 156-71.000.

Mastroni, Joseph. Golf club coupling assembly. 4,441,837, Cl. 403-300.000.

Masuko, Akinori: *See*—
Hayashida, Shizuo; and Masuko, Akinori, 4,442,413, Cl. 331-1.00A.

Masur, John J. Fishing lure holder. 4,441,274, Cl. 43-25.200.

Matematicko-fyzikalni fakulta University Karlovy v Praze: *See*—
Emmer, Ivan; Hajek, Zdenek; and Repa, Petr, 4,441,968, Cl. 204-35.00N.

Matsuda, Masaaki: *See*—
Kataoka, Yushin; Matsuda, Masaaki; and Kamoda, Masaru, 4,442,231, Cl. 521-32.000.

Matsuda, Shunsuke; Ito, Akio; Katsuaki, Mitani; Yoshinobu, Murakami; and Tooru, Tamura, to Matsushita Electric Industrial Co., Ltd. Heat cycle injection compression molding method and a temperature control apparatus. 4,442,061, Cl. 264-328.700.

Matsui, Nobuo: *See*—
Iwataki, Isao; Kaeriyama, Minoru; Matsui, Nobuo; and Yamada, Tomio, 4,442,116, Cl. 424-270.000.

Matsui, Takeki: *See*—
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Matsumura, Sowjun; Araki, Ken; Otaka, Tetsuo; and Tanigawa, Masumi, to C. Uyemura & Co., Ltd. Codeposition method. 4,441,965, Cl. 204-16.000.

Matsuno, Izumi: *See*—
Nakabayashi, Yasuyuki; Matsura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,441,260, Cl. 34-15.000.

Matsuno, Masaaki: *See*—
Sashiki, Takashi; Matsuno, Masaaki; Kobayashi, Noboru; and Mikami, Yoshiharu, 4,441,569, Cl. 177-211.000.

Matsura, Yoshio: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
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Ouchi, Hiromu; Kawashima, Syunichiro; Nishida, Masamitsu; and Ueda, Ichiro, 4,442,220, Cl. 501-139.000.
Sakurada, Okinobu, 4,441,370, Cl. 73-651.000.
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Matsuyama, Masahiro: *See*—
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Matt, Joseph; and Ferrara, John M., to Nalco Chemical Company. Coal-water slurry viscosity reduction using olefin/maleic acid salt copolymers. 4,441,888, Cl. 44-51.000.

Matukura, Yoshiharu; and Sudo, Denpei, to Takeda Chemical Industries, Ltd.; and Daikyo Gomu Seiko, Ltd. Pierceable closure member for vial. 4,441,621, Cl. 215-247.000.

Mauch, Magnus: *See*—
Greiner, Wolfgang H. A.; and Mauch, Magnus, 4,442,150, Cl. 428-53.000.

Mauries, Reinhard: *See*—
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Maxon, Glenway W., III, to Maxon Industries, Inc. Concrete mix surge bin. 4,441,820, Cl. 366-26.000.

Maxon Industries, Inc.: *See*—
Maxon, Glenway W., III, 4,441,820, Cl. 366-26.000.

May & Baker Limited: *See*—
Ramsden, Christopher A.; Knowles, Philip; Lewis, Edward J.; Lunt, Edward; and Wright, Derek E., 4,442,115, Cl. 424-269.000.

Mayer, Donald K., to Thermo King Corporation. Transport refrigeration unit combination airflow straightener and defrost damper. 4,441,333, Cl. 62-239.000.

Mayer, Gilbert: *See*—
Malivoir, Roger; and Mayer, Gilbert, 4,441,847, Cl. 414-31.000.

Mayer, Robert T., to U.S. Philips Corporation. Protected programmable apparatus. 4,442,486, Cl. 364-200.000.

Mayne, Richard G. Musical instrument holder for attachment to vertical and horizontal surfaces. 4,441,683, Cl. 248-558.000.

McAloon, Kevin: *See*—
Briggs, Peter J.; McAloon, Kevin; and Rideal, Graham R., 4,442,164, Cl. 428-283.000.

McAuliffe, Charles A.: *See*—
Hill, William E.; and McAuliffe, Charles A., 4,442,297, Cl. 549-206.000.

McBrayer, Bob W. Sesame nematocidal composition. 4,442,092, Cl. 424-195.000.

McBride, Paul: *See*—
Passmore, David T.; Wooten, Willis C.; and McBride, Paul, 4,442,270, Cl. 525-440.000.

McCally, Richard P.: *See*—
Graham, George W.; and McCally, Richard P., 4,441,389, Cl. 83-140.000.

McClure, David E.: *See*—
Atkinson, Joseph G.; Baldwin, John J.; and McClure, David E., 4,442,094, Cl. 424-246.000.

McCombs, Grace N.: *See*—
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McCombs, Norman: *See*—
McCombs, Norman R.; and McCombs, Grace N., 4,441,506, Cl. 128-728.000.

McCombs, Norman R.; and McCombs, Grace N., to McCombs, Norman. Respiratory exerciser. 4,441,506, Cl. 128-728.000.

McCoy, David R.; Gipson, Robert M.; and Naylor, Carter G., to Texaco Inc. Oil recovery method utilizing a dicyclopentadiene derived ethoxysulfonate. 4,442,043, Cl. 260-513.00R.

McCurley, Jack, to Q-dot Corporation. Waste heat recovery system having thermal sleeve support for heat pipe. 4,441,544, Cl. 165-1.000.

McCutchen, Norman L., to Cummins Engine Company, Inc. Pallet-forming apparatus. 4,441,643, Cl. 227-110.000.

McDaniel, Charles R.; and Baumgardner, H. Richard, to Firestone Tire & Rubber Company, The. Coded tape for determining tire size. 4,441,258, Cl. 33-179.000.

McDaniel, Kenneth G.: *See*—
Zimmerman, Robert L.; and McDaniel, Kenneth G., 4,442,237, Cl. 521-131.000.

McDaniel, Max P.; and Johnson, Marvin M., to Phillips Petroleum Company. Polymerization process using a phosphate containing support for vanadium catalyst. 4,442,274, Cl. 526-95.000.

McDermott, Noel C., to Larus Corporation. Switchable incremental attenuation for telephone line interface. 4,442,325, Cl. 179-190.000.

McDonagh, Andrew J.; and Duke, Charles B., to Mesta Engineering Company. Vertical mill. 4,441,352, Cl. 72-249.000.

McDonnell Douglas Corporation: *See*—
Boehringer, Wilfred E.; and Verhoeven, Teunes, 4,441,675, Cl. 244-213.000.
Kosmoski, Jeffrey P., 4,441,842, Cl. 410-81.000.

McDougall, Lee A.: *See*—
Looney, James R.; and McDougall, Lee A., 4,442,014, Cl. 252-8.55C.

McErlane, James E.: *See*—
Cloud, Nathan; Marin, Robert A.; and McErlane, James E., 4,441,660, Cl. 242-35.50A.

McKelvey, Harold E.; Livingston, William T.; and Sheldon, Edward D., to Shatterproof Glass Corporation. Apparatus for curving and tempering glass sheets. 4,441,909, Cl. 65-273.000.

McMickle, Robert L.; and Rumbaugh, James T., to Berkley and Company, Inc. Resilient ferrule cover for fishing rods. 4,441,273, Cl. 43-18.100.

McMickle, Robert L.; and Foote, Danny R., to Berkley and Company, Inc. Artificial fish habitat. 4,441,453, Cl. 119-3.000.

McQuain, David B.: *See*—
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,441,508, Cl. 128-736.000.

McQueen, George; and Barrable, Victor E., to Cape Boards & Panels Limited. Construction panels. 4,441,293, Cl. 52-377.000.

McRoskey, Jack W., to Republic Tool & Manufacturing Corporation. Tube punching method. 4,441,395, Cl. 83-862.000.

McVey, Charles I.: *See*—
Frey, Robert G.; and McVey, Charles I., 4,442,378, Cl. 315-47.000.
Frey, Robert G.; and McVey, Charles I., 4,442,379, Cl. 315-47.000.

Mead Corporation, The: *See*—
Davis, James W., 4,441,806, Cl. 355-23.000.

Mead, Ronald C., to Bendix Corporation, The. Sonar transceiver system and method. 4,442,513, Cl. 367-100.000.

Meade, Steven L.: *See*—
Morris, Merle E.; Rice, Lawrence M.; and Meade, Steven L., 4,442,374, Cl. 313-316.000.
Meadox Instruments, Inc.: *See*—
Kahn, Alan R.; Clark, Kenneth R.; and Bahr, Dennis E., 4,441,357, Cl. 73-40.000.
Meagher, Ralph E.: *See*—
Lipschutz, Lewis D.; Meagher, Ralph E.; and Presti, Frank P., 4,442,450, Cl. 357-81.000.
Medard, Paul: *See*—
Bouverot, Noel; Medard, Paul; and Viale, Alain, 4,442,060, Cl. 264-328.200.
Meer, Vadim V.; Nesterov, Vladimir I.; and Lapshin, Boris G., to Ryazansky Radiotekhnichesky Institut. Digital output telemetering system for recording seismic signals. 4,442,511, Cl. 367-78.000.
Mehaffey, Joseph L., to Akzona Incorporated. Polyalkoxylated amines as dewatering aids for feldspathic minerals. 4,442,010, Cl. 210-729.000.
Mehlan, Bernd; and Bayer, Josef, to Sielaff GmbH & Co. Trap door chute for vending machines. 4,441,628, Cl. 221-90.000.
Mehnert, Gottfried: *See*—
Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., 4,442,063, Cl. 264-532.000.
Meienhofer, Johannes A.: *See*—
Felix, Arthur M.; Ishitsuka, Hideo; Meienhofer, Johannes A.; and Ohta, Yumiko, 4,442,031, Cl. 260-112.50R.
Meier, Henry G.: *See*—
Gray, Keith I.; and Meier, Henry G., 4,442,329, Cl. 200-148.00B.
Meininger, Fritz; Otten, Joachim W., deceased; by Otten, Ursla, heir; and by Rudolph, Anna G., heir, to Hoechst Aktiengesellschaft. Anthraquinone compounds. 4,442,288, Cl. 544-189.000.
Meitzler, Allen H., to Ford Motor Company. Multiplex transmission medium for application in multiplex vehicle control systems. 4,442,515, Cl. 367-197.000.
Melezoglu, Cevdet; and Smith, David J., to Corning Glass Works. Apparatus and method for determining refractive index profile in a cylindrical article. 4,441,811, Cl. 356-128.000.
Meltsch, Hans-Juergen: *See*—
Foertsch, Johann; and Meltsch, Hans-Juergen, 4,442,155, Cl. 428-99.000.
Meltsch, Hans-Jurgen, to Siemens Aktiengesellschaft. Longitudinally divided cable sleeve of thermo-plastic synthetic material with a shape memory. 4,442,153, Cl. 428-99.000.
Meltsch, Hans-Jurgen: *See*—
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Menke, Josef F., to Elektro-Optik GmbH & Co. KG. Infrared-optical aiming and guiding device. 4,441,668, Cl. 244-3.110.
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Fauss, Rudolf; Sonntag, Michael; Wagner, Kuno; Findeisen, Kurt; and Mennicken, Gerhard, 4,442,279, Cl. 528-44.000.
Mercier, George E.: *See*—
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Mercier, Georges; Mercier, Jacques; and Buisson, Pierre, to Societe MERCIER Freres. Slitting machine, more particularly for hides and leather, unwoven textile products, rubber products, plastics in plates or rolls. 4,441,396, Cl. 83-871.000.
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Mercier, Georges; Mercier, Jacques; and Buisson, Pierre, 4,441,396, Cl. 83-871.000.
Mercil, Robert A. Bird feeder construction. 4,441,458, Cl. 119-51.00R.
Merck & Co., Inc.: *See*—
Atkinson, Joseph G.; Baldwin, John J.; and McClure, David E., 4,442,094, Cl. 424-246.000.
Engelhart, John E.; Angeles, Marshall R.; and D'Errico, Michael J., 4,442,122, Cl. 424-304.000.
Greenlee, William J., 4,442,030, Cl. 260-112.50R.
Johnston, David B. R., 4,442,095, Cl. 424-248.500.
Johnston, David B. R., 4,442,096, Cl. 424-248.500.
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Saari, Walfred S., 4,442,103, Cl. 424-250.000.
Mese, Hisayoshi, to Fuji Kinzoku Kohsaku Co. Ltd. Ball valve. 4,441,524, Cl. 137-625.470.
Meshberg, Philip. Dispenser adapted for fast pressure filling. 4,441,634, Cl. 222-402.160.
Mesta Engineering Company: *See*—
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Meyer, Horst; Sitt, Rudiger; Thomas, Gunter; Garthoff, Benward; Towart, Robertson; and Rosentreter, Ulrich, to Bayer Aktiengesellschaft. Substituted 2-amino-3,4-dihydropyridine derivatives, their production and their medicinal use. 4,442,100, Cl. 424-250.000.
Meyer, Leonard J.: *See*—
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Meyl, Wolfgang: *See*—
Goring, Hermann; Hentschel, Peter; and Meyl, Wolfgang, 4,442,497, Cl. 364-561.000.
Michaels, Alan S.; Robertson, Channing R.; Cohen, Stanley N.; Inloes, Douglas S.; and Smith, William J., to Stanford University. Method of using isotropic, porous-wall polymeric membrane, hollow-fibers for culture of microbes. 4,442,206, Cl. 435-68.000.
Michel, Helmut; Kampe, Wolfgang; and Ofenloch, Roland, to Boehringer Mannheim GmbH. 3-Cyano indoles as intermediates for cardioselective compounds. 4,442,295, Cl. 548-505.000.
Microwriter Limited: *See*—
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Middel, Jan; and Steenkamp, Gezinus A., to Estel Hoogovens B.V. Apparatus and method for scarfing. 4,441,935, Cl. 148-9.500.
Middelburg Steel and Alloys (Proprietary) Limited: *See*—
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Mikami, Takashi: *See*—
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Mikami, Takeshi, to Fuji Photo Film Co., Ltd. Preparation of encapsulated electrostatographic toner material using gelatin derivative. 4,442,194, Cl. 430-137.000.
Mikami, Toshio: *See*—
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Mikami, Yoshiharu: *See*—
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Mikkers, Franciscus E. P.; and Wierenga, Peter E., to U.S. Philips Corporation. Method of depositing a metal. 4,441,964, Cl. 204-15.000.
Miles Laboratories, Inc.: *See*—
Greenquist, Alfred C.; and Walter, Bert, 4,442,204, Cl. 435-7.000.
Milkowski, Wolfgang: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,442,102, Cl. 424-250.000.
Miller Brewing Company: *See*—
Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., 4,441,406, Cl. 99-275.000.
Miller, Curtis D. Portable panel separation device. 4,441,844, Cl. 414-117.000.
Miller, Jack E.; and Brandenburg, Robert C., to Harry Major Machine and Tool Co. Accumulating transfer unit. 4,441,606, Cl. 198-751.000.
Miller, Lester I., to Du Pont de Nemours, E. I., and Company. Additive for alkyd resin coating compositions. 4,442,256, Cl. 524-539.000.
Mims, Samuel S., to El Paso Products Company. Recovery of water miscible organic acids from aqueous solution as alkyl esters. 4,442,303, Cl. 560-191.000.
Minami, Masahumi, to Miyawaki Steam Trap Mfg. Co., Ltd. Exchangeable unit steam trap. 4,441,652, Cl. 236-56.000.
Minnesota Mining and Manufacturing Company: *See*—
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Thuermer, Joerg H. W., 4,442,316, Cl. 174-84.00C.
Minohara, Kiyomi; and Abe, Atsushi, to Furuno Electric Co., Ltd. Gyroscopic instrument. 4,441,375, Cl. 74-5.460.
Minolta Camera Kabushiki Kaisha: *See*—
Shibazaki, Kenji; and Ito, Masazumi, 4,441,804, Cl. 355-14.00R.
Misencik, John J., to Westinghouse Electric Corp. Ground fault receptacle with arrangement for protecting internal electronics. 4,442,470, Cl. 361-46.000.
Mishima Kosan Co., Ltd.: *See*—
Sawada, Yasuhiro; Inoue, Tadashi; and Nishida, Toyoaki, 4,442,389, Cl. 318-642.000.
Mistral Windsurfing AG: *See*—
Fichtner, Hans, 4,441,446, Cl. 114-39.000.
Mitchell, Terence G.; Barnes, Adrian G.; Jackson, Julia S.; and Bevan, Peter C., to British-American Tobacco Co., Ltd. Smoke flavor enhancing agents. 4,441,514, Cl. 131-276.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Adachi, Hiromi, 4,442,380, Cl. 315-101.000.
Akasaka, Yoichi; and Tsukamoto, Katsuhiro, 4,441,932, Cl. 148-1.500.
Endoh, Masakazu, 4,441,901, Cl. 62-160.000.
Fujimoto, Takanori, 4,441,478, Cl. 123-602.000.
Mizuno, Takaji; Suwahara, Hiroshi; and Segawa, Hirohisa, 4,442,339, Cl. 219-130.330.
Okamoto, Kouichi; Sakuyama, Masaki; and Tanaka, Mitsuo, 4,442,369, Cl. 310-214.000.
Uchida, Ryohei; Yamasaki, Tatsuo; Idei, Toshio; Tatsutani, Toshio; and Hagiwara, Ippei, 4,442,386, Cl. 318-254.000.
Utsunomiya, Yumiteru; and Murayama, Shigeru, 4,442,371, Cl. 310-260.000.
Yuyama, Hiroshi, 4,441,331, Cl. 62-196.300.
Mitsui, Nobuo; Maeda, Yasuyuki; Kurihara, Tomiaki; Shima, Seiya; Hatakeyama, Takanobu; and Komuro, Katsu, to Hitachi, Ltd. AC Elevator control system. 4,441,584, Cl. 187-29.00R.
Mitsui Petrochemical Industries, Ltd.: *See*—
Kashiwa, Norio; and Ushida, Yoshihisa, 4,442,276, Cl. 526-125.000.
Miwa, Kiyoshi: *See*—
Tsuchida, Takayasu; Miwa, Kiyoshi; and Nakamori, Shigeru, 4,442,208, Cl. 435-116.000.
Miyake, Toshio; Ohno, Shoichi; and Sakai, Shuzo, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process for the production of monascus-pigment. 4,442,209, Cl. 435-119.000.
Miyamoto, Akira, to Hitachi, Ltd. Fluidizing gas control system in fluidized-bed incinerator. 4,441,435, Cl. 110-245.000.
Miyasaka, Seiichi: *See*—
Noda, Akinori; Miyasaka, Seiichi; and Kawahara, Hiroshi, 4,442,177, Cl. 428-412.000.

Miyashita, Hideo: *See*—
Inaba, Hajimu; and Miyashita, Hideo, 4,442,521, Cl. 371-68.000.
Miyawaki Steam Trap Mfg. Co., Ltd.: *See*—
Minami, Masahumi, 4,441,652, Cl. 236-56.000.
Mizuno, Akinori, to Ricoh Co. Ltd. Ink jet printing apparatus. 4,442,439, Cl. 346-1.100.
Mizuno, Takaji; Suwahara, Hiroshi; and Segawa, Hirohisa, to Mitsubishi Denki Kabushiki Kaisha. Constant voltage DC arc welding apparatus. 4,442,339, Cl. 219-130.330.
Mizutani, Eiji: *See*—
Wakai, Hideyuki; Kashimoto, Masataka; Sakamoto, Chiaki; and Mizutani, Eiji, 4,442,493, Cl. 364-475.000.
Mo, Luigi: *See*—
Iemmi, Giuliano; Raimondo, Michele; and Mo, Luigi, 4,441,976, Cl. 204-224.00M.
Mobay Chemical Corporation: *See*—
Taylor, Ronald P.; Dewhurst, John E.; and Abouzahr, Saad M., 4,442,235, Cl. 521-122.000.
Mobil Oil Corporation: *See*—
Chester, Arthur W.; and Stover, William A., 4,442,223, Cl. 502-68.000.
Dessau, Ralph M.; and Haag, Werner O., 4,442,210, Cl. 435-161.000.
Dwyer, Francis G.; and Garwood, William E., 4,441,991, Cl. 208-111.000.
Heck, Roland H.; Rosinski, Edward J.; and Shih, Stuart S., 4,442,023, Cl. 502-222.000.
Huang, Yun-Yang, 4,441,990, Cl. 208-111.000.
Myers, Donald W.; and Vivlamore, Samantha L., 4,442,064, Cl. 264-551.000.
Schmitt, Kirk D., 4,442,042, Cl. 260-512.00R.
Shu, Winston R., 4,441,555, Cl. 166-272.000.
Stowe, Lawrence R., 4,441,986, Cl. 208-11.00R.
Molins Limited: *See*—
Gabbitas, Denbigh M.; and Shawyer, Peter J., 4,441,302, Cl. 53-52.000.
Mollier, Jean H.; and Ugon, Michel, to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme). Apparatus for and method of recycling recording carriers, such as credit cards, including non-volatile erasable memories for identification data. 4,442,345, Cl. 235-380.000.
Momose, Haruhiko; Takahashi, Toshiaki; and Hoshino, Yasushi, to Konishiroku Photo Industry Co., Ltd. Range finder. 4,441,810, Cl. 356-1.000.
Monarch Marking Systems, Inc.: *See*—
Huggins, Orville C., 4,441,425, Cl. 101-292.000.
Monsanto Company: *See*—
Purdum, William R., 4,442,044, Cl. 260-969.000.
Reynertson, Philip S., 4,442,052, Cl. 264-30.000.
Tou, Jacob S.; and Schleppnik, Alfred A., 4,442,298, Cl. 549-252.000.
Monson, Clifford L. Rotary cleaner-polisher. 4,441,229, Cl. 15-322.000.
Montalbano, Anthony P. Cold weather breathing device. 4,441,494, Cl. 128-204.170.
Montedison S.p.A.: *See*—
Gozzo, Franco; Caprara, Giuseppe; Roberti, Lamberto; Paparatto, Giuseppe; and Santoro, Ettore, 4,442,301, Cl. 560-124.000.
Marciandi, Franco; and Relvini, Pasquale, 4,442,255, Cl. 524-414.000.
Montgomery, James W.: *See*—
Baugh, John L.; and Montgomery, James W., 4,441,560, Cl. 166-382.000.
Evans, Robert W.; and Montgomery, James W., 4,441,559, Cl. 166-382.000.
Montie, Douglas L., to Thomas G. Faria Corp. Liquid-level transducer-/indicator. 4,441,364, Cl. 73-313.000.
Moody, George W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Energy in Her Britannic Majesty's Government of the. Wave energy device. 4,441,316, Cl. 60-398.000.
Moraw, Roland; and Schadlich, Renate, to Hoechst Aktiengesellschaft. Method for selective lamination of thermoplastic layers. 4,441,945, Cl. 156-108.000.
Morehouse Industries, Inc.: *See*—
Szkaradek, Edward J., 4,441,658, Cl. 241-46.170.
Moreland, John F.; and Stoffel, James C., to Xerox Corporation. Adaptive thresholder. 4,442,544, Cl. 382-53.000.
Moret, David M.: *See*—
Ahr, Nicholas A.; and Moret, David M., 4,441,212, Cl. 2-49.00R.
Morgan, Hugh W.; and Daniel, Roy M., to Development Finance Corporation of New Zealand. Thermo-stable micro-organism. 4,442,214, Cl. 435-253.000.
Mori, Kashichi, to Kowa Shoji Kabushiki Kaisha. Pineapple cutter. 4,441,413, Cl. 99-542.000.
Mori, Sanae, to Daido Metal Company, Ltd. Method of producing connecting rod of a radial piston motor. 4,441,240, Cl. 29-156.50A.
Mori, Yoshikatsu, to Sumitomo Electric Industries, Ltd. Throw away insert. 4,441,841, Cl. 407-114.000.
Moriguchi, Fujio: *See*—
Kikuchi, Yoshiki; Omori, Takashi; Moriguchi, Haruhiko; Moriguchi, Fujio; and Murayama, Tomio, 4,442,441, Cl. 346-74.400.
Kurata, Masami; Moriguchi, Fujio; Ohmori, Takashi; and Makino, Katsuo, 4,442,452, Cl. 358-75.000.
Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Murayama, Tomio, 4,442,460, Cl. 358-296.000.
Moriguchi, Haruhiko: *See*—
Kikuchi, Yoshiki; Omori, Takashi; Moriguchi, Haruhiko; Moriguchi, Fujio; and Murayama, Tomio, 4,442,441, Cl. 346-74.400.
Morimoto, Hideaki, to Nippon Electric Company, Ltd. Channel switching system for use in a digital communication system. 4,442,518, Cl. 371-8.000.
Moriwaki, Hisayoshi: *See*—
Shirai, Hidemichi; Nakano, Kenji; and Moriwaki, Hisayoshi, 4,442,461, Cl. 358-343.000.
Moriya, Koichi: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; and Moriya, Koichi, 4,441,913, Cl. 71-94.000.
Moroishi, Yutaka: *See*—
Sunakawa, Makoto; Moroishi, Yutaka; and Mune, Isao, 4,442,258, Cl. 524-767.000.
Morokawa, Shigeru, to Citizen Watch Co., Ltd. Low-power integrated circuit for an electronic timpeiece. 4,441,825, Cl. 368-204.000.
Morokawa, Shigeru; and Koga, Keiichiro, to Citizen Watch Company Limited. Electronic timepiece. 4,441,826, Cl. 368-204.000.
Morrell, Roberto I.; and Peters, Charles F., to W. R. Grace & Co. Process for producing a stabilized phosphoric acid. 4,442,081, Cl. 423-321.00R.
Morris, Merle E.; Rice, Lawrence M.; and Meade, Steven L., to GTE Products Corporation. Dual length copier lamp. 4,442,374, Cl. 313-316.000.
Morris, Peter A., to Cresta Technology Limited. Filtration devices. 4,442,002, Cl. 210-411.000.
Morsing, Per: *See*—
Donelly, James R.; Felsvang, Karsten S.; Morsing, Per; and Veltman, Preston L., 4,442,079, Cl. 423-239.000.
Donnelly, James R.; Felsvang, Karsten S.; Morsing, Per; and Veltman, Preston L., 4,442,080, Cl. 423-239.000.
Mort, John S.: *See*—
Poole, A. Robin; Mort, John S.; and Recklies, Anneliese D., 4,442,088, Cl. 424-85.000.
Morton, David C. Door locking alarm device. 4,442,427, Cl. 340-546.000.
Mosimann, Urs: *See*—
Baumann, Hans-Peter; and Mosimann, Urs, 4,441,884, Cl. 8-542.000.
Moskau, Gerhard, to Saarberg-Fernwarme GmbH. Process for thermic treatment of sludges, particularly treatment of clarification sludges. 4,441,437, Cl. 110-346.000.
Most, Ivan G.; and Hubble, William S., to Kramer Industries, Inc. Treatment method for metal bearing oily waste. 4,441,922, Cl. 75-25.000.
Motorola, Inc.: *See*—
Epsom, Robert L.; Gailus, Paul H.; and van den Heuvel, Anthony P., 4,442,416, Cl. 333-263.000.
Kongable, Lowell S.; and Bauer, Clint E., 4,442,500, Cl. 364-724.000.
Main, William E., 4,442,549, Cl. 455-211.000.
Myers, Michael H.; and Daniel, Sam, 4,442,433, Cl. 343-378.000.
Siwiak, Kazimierz; Garay, Oscar M.; and Balzano, Quirino, 4,442,438, Cl. 343-792.000.
Mowbray, Dorian F.: *See*—
Jarrett, Boaz A.; and Mowbray, Dorian F., 4,441,474, Cl. 123-450.000.
MPS - Multi Packaging Services S.r.l.: *See*—
Sommariva, Gabriella, 4,441,611, Cl. 206-431.000.
Muacevic, Gojko: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,442,120, Cl. 424-282.000.
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,442,121, Cl. 424-282.000.
Muchmore, Charles B.; Chen, Juh W.; and Tempelmeyer, Kenneth E., to Southern Illinois University Foundation. Process for removing organic sulphur from coal and material resulting from the process. 4,441,886, Cl. 44-15.00R.
Mueller, Herbert; Axel, Hartmut; and Wittwer, Arnold, to BASF Aktiengesellschaft. Production of tertiary amines. 4,442,306, Cl. 564-479.000.
Muhlenbeck, Josef: *See*—
Zolner, Dieter H.; Rittmann, Friedrich; Dung, Herbert; Haremza, Johannes; Bauer, Georg; Otto, Josef; Muhlenbeck, Josef; and Lauterbach-Dammler, Inge, 4,442,525, Cl. 373-93.000.
Muir, William, to Engineered Roof Trusses Pty. Ltd. Framed building construction. 4,441,287, Cl. 52-93.000.
Mulder, John G.: *See*—
Welch, Richard D.; and Mulder, John G., 4,441,663, Cl. 242-65.000.
Mullane, William I., Jr., to Procter & Gamble Company, The. Method and apparatus for uniformly debossing and aperturing a resilient plastic web. 4,441,952, Cl. 156-222.000.
Mullen, Gerald H., to Virginia Industries, Inc. Method for manufacture of bearings. 4,441,239, Cl. 29-148.40A.
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. Antithrombotic sulfimino and sulfoximino indolinones-2. 4,442,111, Cl. 424-263.000.
Muller-Schweinitzer, Else, to Sandoz Ltd. Dihydropyridine derivatives useful in treating vascular headaches. 4,442,112, Cl. 424-263.000.
Mullins, James N., Jr. Slicer for ham or the like. 4,441,411, Cl. 99-538.000.
Multicore Solders Limited: *See*—
Arbib, Gordon F., 4,441,924, Cl. 75-65.00R.

Munchener Apparatebau fur elektronische Ger/e Kimmel GmbH: *See*—
Kreiner, Hans-Jurg, 4,442,358, Cl. 250-435.000.
Munday, Peter J., to Racal Research Limited. Synchronization systems. 4,442,527, Cl. 375-1.000.
Mune, Isao: *See*—
Sunakawa, Makoto; Moroishi, Yutaka; and Mune, Isao, 4,442,258, Cl. 524-767.000.
Muranaka, Yutaka; and Sadahiro, Haruji, to Nisshin Steel Co., Ltd. Method of enlarging width of continuously cast strand. 4,441,543, Cl. 164-491.000.
Murano, Itaru: *See*—
Sumi, Masao; Suenaga, Junichi; Takenaka, Masazo; Murano, Itaru; Tanabe, Mikio; and Hirai, Kiyoshi, 4,442,252, Cl. 524-183.000.
Murata Manufacturing Co., Ltd.: *See*—
Murata, Michihiro; Kitao, Shoichi; and Okabe, Shinsei, 4,442,422, Cl. 338-35.000.
Murata, Michihiro; Kitao, Shoichi; and Okabe, Shinsei, to Murata Manufacturing Co., Ltd. Humidity sensitive resistor. 4,442,422, Cl. 338-35.000.
Murayama, Shigeru: *See*—
Utsunomiya, Yumiteru; and Murayama, Shigeru, 4,442,371, Cl. 310-260.000.
Murayama, Tomio: *See*—
Kikuchi, Yoshiki; Omori, Takashi; Moriguchi, Haruhiko; Moriguchi, Fujio; and Murayama, Tomio, 4,442,441, Cl. 346-74.400.
Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Murayama, Tomio, 4,442,460, Cl. 358-296.000.
Murphy, Walter T.; and Guiley, Clifford D., Jr., to B. F. Goodrich Company, The. Process for treating hydroxyl terminated liquid polymers. 4,442,039, Cl. 260-465.400.
Muscatell, Ralph P. Airfoil fuel ejection device. 4,441,673, Cl. 244-135.00R.
Mutzberg, Friedhelm: *See*—
Weiss, Jorn-Volker; Riemer, Heinz; and Mutzberg, Friedhelm, 4,442,245, Cl. 523-401.000.
Myers, Donald W.; and Vivlamore, Samantha L., to Mobil Oil Corporation. Thermoforming and self-alignment trimming method and apparatus. 4,442,064, Cl. 264-551.000.
Myers, John L., to Ledex, Inc. Trip solenoid. 4,442,418, Cl. 335-230.000.
Myers, Michael H.; and Daniel, Sam, to Motorola Inc. Adaptive signal processing apparatus. 4,442,433, Cl. 343-378.000.
Naarden International, N.V.: *See*—
Boelens, Harmannus; van der Weerdt, Antonius J. A.; and Hesp, Theodorus G. M., 4,442,025, Cl. 252-522.00R.
Nabisco Brands, Inc.: *See*—
Horwath, Robert O.; and Ibrahim, Osama O., 4,442,207, Cl. 435-105.000.
Portsmouth, Joseph P., 4,441,648, Cl. 229-37.00R.
Nadler, Guy: *See*—
Le Polles, Jean-Bernard; Martin, Michel; Nadler, Guy; and Saias, Edmond, 4,442,108, Cl. 424-258.000.
Nagahara, Hiroshi; and Uchimura, Tosio, to Kabushiki Kaisha Komatsu Seisakusho. Hoisting winch mounted on crane or the like. 4,441,691, Cl. 254-344.000.
Nagami, Akira, to Nippon Electric Co., Ltd. High speed latch circuit. 4,442,365, Cl. 307-279.000.
Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Current source circuit. 4,442,399, Cl. 323-315.000.
Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Voltage-to-current converting circuit. 4,442,400, Cl. 323-315.000.
Nagaoka, Kazuya; and Yoshii, Sigeru, to Kawasaki Kasei Chemicals Ltd. Heat-sensitive recording sheet. 4,442,176, Cl. 346-208.000.
Nagasaku, Eiichi: *See*—
Hotta, Teruyuki; Kurokawa, Yoshiki; Nagasaku, Eiichi; and Yasunaga, Masao, 4,441,863, Cl. 417-281.000.
Nagel, Erich; and Turcke, Rainer, to Agfa-Gevaert AG. Device for collecting and stacking photographic prints. 4,441,702, Cl. 271-177.000.
Nagy, Alex J.; and Reed, William G., to Margaret's Fine Food Ltd. Angled dough cutter. 4,442,131, Cl. 426-518.000.
Nakabayashi, Yasuyuki; Matsura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, to Electric Power Development Co. Ltd.; and Kawasaki Jukogyo Kabushiki Kaisha. Process and apparatus for dehydrating organic solid material. 4,441,260, Cl. 34-15.000.
Nakagawa, Sotoji: *See*—
Kasai, Shinichi; Nakagawa, Sotoji; and Osawa, Nobuyuki, 4,441,765, Cl. 308-6.00C.
Nakagawa, Yasuo: *See*—
Saito, Takahide; and Nakagawa, Yasuo, 4,441,875, Cl. 425-3.000.
Nakahara, Teruo; Ota, Shingo; and Nakamura, Masaru, to Kabushiki Kaisha Komatsu Seisakusho. Vehicle inching mechanism interlocked with a braking mechanism. 4,441,596, Cl. 192-13.00R.
Nakamori, Shigeru: *See*—
Tsuchida, Takayasu; Miwa, Kiyoshi; and Nakamori, Shigeru, 4,442,208, Cl. 435-116.000.
Nakamura, Akira: *See*—
Nakabayashi, Yasuyuki; Matsura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,441,260, Cl. 34-15.000.
Nakamura, Masaru: *See*—
Nakahara, Teruo; Ota, Shingo; and Nakamura, Masaru, 4,441,596, Cl. 192-13.00R.
Nakamura, Shinichi: *See*—
Takada, Syun; Kadowaki, Takashi; Okumura, Mitsuhiro; Nakamura, Shinichi; and Iwagaki, Masaru, 4,442,201, Cl. 430-569.000.
Nakamura, Shinya: *See*—
Taga, Yutaka; Watanabe, Kazuaki; and Nakamura, Shinya, 4,441,385, Cl. 74-867.000.
Nakamura, Sukenori: *See*—
Igarashi, Akira; and Nakamura, Sukenori, 4,442,179, Cl. 428-220.000.
Nakamura, Yukio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Lash adjuster oil-supplying device. 4,441,465, Cl. 123-90.340.
Nakano, Keita: *See*—
Toba, Hirotaka; Itoh, Masanori; Nakano, Keita; Wakoh, Shoji; Toyoshima, Toshihiko; and Todo, Hidemasa, 4,442,160, Cl. 428-215.000.
Nakano, Kenji: *See*—
Shirai, Hidemichi; Nakano, Kenji; and Moriwaki, Hisayoshi, 4,442,461, Cl. 358-343.000.
Nakano, Yoshiyuki, to Nippon Kogaku K.K. Driving system in camera. 4,441,800, Cl. 354-152.000.
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, to Nissan Motor Company, Limited. Method and system for dual control of resistance welding. 4,442,337, Cl. 219-117.100.
Nalco Chemical Company: *See*—
Matt, Joseph; and Ferrara, John M., 4,441,888, Cl. 44-51.000.
Napflin, Hans. Ski binding with a foot support. 4,441,732, Cl. 280-614.000.
Narita, Masahisa; and Tomita, Osamu, to Fujitsu Limited. Adaptive high speed serial printer. 4,441,832, Cl. 400-144.200.
Narr, Berthold: *See*—
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,442,111, Cl. 424-263.000.
National Business Systems, Inc.: *See*—
Sours, William A, 4,441,419, Cl. 101-45.000.
National Gypsum Company: *See*—
Winkowski, Daniel A., 4,442,151, Cl. 428-54.000.
National Research Development Corporation: *See*—
Evans, David M.; and Weightman, Barry O., 4,441,489, Cl. 128-77.000.
National Semiconductor Corporation: *See*—
Priel, Ury; Yaron, Giora; and Ebel, Mark S., 4,442,510, Cl. 365-218.000.
Naumann, Johannes; Pohl, Wolfgang; and Forster, Karl-Heinz, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Control system for controlling regulating members of printing machines. 4,441,424, Cl. 101-248.000.
Navok, Ezra: *See*—
Buan, Danilo P.; and Navok, Ezra, 4,441,420, Cl. 101-69.000.
Naylor, Carter G.: *See*—
McCoy, David R.; Gipson, Robert M.; and Naylor, Carter G., 4,442,043, Cl. 260-513.00R.
Naylor, Donald B., deceased (Trust, Marshall County Bank and, executor). Invertible prefabricated door. 4,441,277, Cl. 49-380.000.
NCR Corporation: *See*—
Italiano, Victor J., 4,441,830, Cl. 400-124.000.
NDM Corporation: *See*—
Parent, James R., 4,441,501, Cl. 128-641.000.
Neal, Dennis E. Disposable kitty litter box. 4,441,451, Cl. 119-1.000.
NECCHI: *See*—
Bianchi, Nereo, 4,441,441, Cl. 112-221.000.
Nederveld, Terril L., to Packaging Corporation of America. Collapsible receptacle. 4,441,649, Cl. 229-38.000.
Negen, Anno G.: *See*—
Oostenbrink, Albertus A.; Negen, Anno G.; and van Kaam, Marinus L. G., 4,441,744, Cl. 285-162.000.
Neiditch, David S.; Bullano, Gerald A.; DiLullo, Robert J.; and Ofstein, David E., to Atlantic Richfield Company. Process and apparatus for continuous polymerization of a monovinyl aromatic monomer. 4,442,273, Cl. 526-88.000.
Neilsen, Hildaur L. Key retaining device. 4,441,348, Cl. 70-389.000.
Nelson, Gary L.: *See*—
White, William H.; Harbison, William C.; and Nelson, Gary L., 4,442,168, Cl. 428-331.000.
Nelson, Peter C.: *See*—
Klee, David J.; and Nelson, Peter C., 4,441,327, Cl. 62-51.000.
Nesterov, Vladimir I.: *See*—
Meer, Vadim V.; Nesterov, Vladimir I.; and Lapshin, Boris G., 4,442,511, Cl. 367-78.000.
Neubauer, Reinhard: *See*—
Limque, Ferdinand; Luiten, Cornelis H.; Bless, Franz; Neubauer, Reinhard; and Lange, Dietmar, 4,441,698, Cl. 266-249.000.
Neumann, Kurt; and Dietrich, Wolfgang, to Wilhelm Leeser Gummi- und Kunststoffverarbeitung GmbH & Co., KG. Rubber sealing member. 4,442,174, Cl. 428-376.000.
Neuzil, Richard W.; and Priegnitz, James W., to UOP Inc. Process for separating glucose from fructose by selective adsorption. 4,442,285, Cl. 536-127.000.
Newcomb, Donald R. Vertical antenna. 4,442,436, Cl. 343-722.000.
Newton, Ronald O., to General Signal. Relay valve assembly. 4,441,764, Cl. 303-40.000.
NGK Spark Plug Co., Ltd.: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,442,375, Cl. 313-142.000.

Nicholas Proprietary Limited: *See*—
Rowe, James S.; and Carless, John E., 4,442,051, Cl. 264-4.300.
Nicholas, Terry G., to Wavin B.V. Coupling pipe part for interconnecting corrugated pipe parts. 4,441,745, Cl. 285-417.000.
Nickl, Josef: *See*—
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,442,111, Cl. 424-263.000.
Nicolaou, Kyriacos C.; Petasis, Nicos A.; and Seitz, Steven P., to Research Corporation. Leukotriene analogues. 4,442,099, Cl. 424-248.570.
Nielsen, Anker J., Jr.; and Hoyt, Richard E., to Omco Inc. High security locks and key. 4,441,343, Cl. 70-34.000.
Nigrey, Paul J.: *See*—
MacDiarmid, Alan G.; Heeger, Alan J.; and Nigrey, Paul J., 4,442,187, Cl. 429-213.000.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; and Moriya, Koichi, 4,441,913, Cl. 71-94.000.
Niklaus, Zemp J., to Texcontor-Anstalt. Valproic acid ester with antiepileptic and anticonvulsant activity and pharmaceutical compositions therefrom. 4,442,124, Cl. 424-311.000.
Nippon Crucible Co., Ltd.: *See*—
Takuo, Hosaka, 4,442,050, Cl. 264-30.000.
Nippon Electric Co., Ltd.: *See*—
Ashida, Shigeaki, 4,442,415, Cl. 332-16.00T.
Morimoto, Hideaki, 4,442,518, Cl. 371-8.000.
Nagami, Akira, 4,442,365, Cl. 307-279.000.
Noguchi, Kesao, 4,441,973, Cl. 204-192.00N.
Nippon Kogaku K.K.: *See*—
Iizuka, Yutaka, 4,441,802, Cl. 354-224.000.
Kazami, Kazuyuki; and Ohtsubo, Yoshiaki, 4,441,774, Cl. 315-241.00P.
Nakano, Yoshiyuki, 4,441,800, Cl. 354-152.000.
Nippon Oil Co. Ltd.: *See*—
Kawabata, Nobuaki; Yokoyama, Nobuo; and Araki, Yoshihiko, 4,442,140, Cl. 427-154.000.
Nippon Paint Company, Ltd.: *See*—
Ishikura, Shinichi; Kanda, Kazunori; and Yamaguchi, Shohachiro, 4,442,247, Cl. 523-414.000.
Kanda, Kazunori; and Ishikura, Shinichi, 4,442,248, Cl. 523-414.000.
Nippon Petrochemicals Company Ltd.: *See*—
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, 4,442,027, Cl. 252-574.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Kasai, Shinichi; Nakagawa, Sotoji; and Osawa, Nobuyuki, 4,441,765, Cl. 308-6.00C.
Nippon Soda Company, Limited: *See*—
Iwataki, Isao; Kaeriyama, Minoru; Matsui, Nobuo; and Yamada, Tomio, 4,442,116, Cl. 424-270.000.
Nippon Soken, Inc.: *See*—
Kodera, Masao; and Akita, Sigeyuki, 4,442,512, Cl. 367-87.000.
Takagi, Shigeru; and Tomita, Masahiro, 4,441,899, Cl. 55-485.000.
Tsuge, Noboru; Shimogawa, Toshiaki; Kuwakado, Satosi; and Takei, Toshihiro, 4,441,738, Cl. 280-806.000.
Nippon Steel Corporation: *See*—
Saito, Takao; and Ezure, Kazuya, 4,442,181, Cl. 428-623.000.
Sawada, Yasuhiro; Inoue, Tadashi; and Nishida, Toyoaki, 4,442,389, Cl. 318-642.000.
Takahashi, Nobuyuki; Shibata, Masaaki; and Furuno, Yoshikuni, 4,441,936, Cl. 148-12.00C.
Nippondenso Co., Ltd.: *See*—
Hotta, Teruyuki; Kurokawa, Yoshiki; Nagasaku, Eiichi; and Yasunaga, Masao, 4,441,863, Cl. 417-281.000.
Isomura, Shigenori; Kodama, Katsuhiko; Kondo, Toshio; and Kobayashi, Akio, 4,441,473, Cl. 123-440.000.
Shirasaki, Shinji; Tsuzuki, Yoshihiko; Hirabayashi, Yuzi; Okazaki, Hiroshi; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,442,424, Cl. 340-52.00F.
Nirschl, Robert P. Wrist brace. 4,441,490, Cl. 128-77.000.
Nirschl, Robert P. Elbow brace. 4,441,493, Cl. 128-165.000.
Nishida, Masamitsu: *See*—
Ouchi, Hiromu; Kawashima, Syunichiro; Nishida, Masamitsu; and Ueda, Ichiro, 4,442,220, Cl. 501-139.000.
Nishida, Toyoaki: *See*—
Sawada, Yasuhiro; Inoue, Tadashi; and Nishida, Toyoaki, 4,442,389, Cl. 318-642.000.
Nishikawa, Masaji, to Olympus Optical Company Ltd. Electrophotographic copying process for producing a plurality of copies. 4,442,191, Cl. 430-55.000.
Nishikawa, Reiji; Satoyama, Shozo; Ito, Yoshinori; and Jyo, Hidetaka, to Tokyo Shibaura Denki Kabushiki Kaisha; and Tokuda Seisakusho, Ltd. Magnetron sputtering apparatus. 4,441,974, Cl. 204-192.00R.
Nishimura, Akira: *See*—
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, 4,442,337, Cl. 219-117.100.
Nishimura, Ken-ichi: *See*—
Kakeya, Nobuharu; Kitao, Kazuhiko; and Nishimura, Ken-ichi, 4,442,090, Cl. 424-178.000.
Nishina, Shuho: *See*—
Kawaguchi, Hiroshi; and Nishina, Shuho, 4,441,380, Cl. 74-512.000.
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, to NGK Spark Plug Co., Ltd. Electrical self-purification ignition plug. 4,442,375, Cl. 313-142.000.
Nissan Motor Co., Ltd.: *See*—
Chikaraishi, Takayo, 4,441,276, Cl. 49-352.000.
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,441,479, Cl. 123-605.000.
Endo, Toshiaki; and Yoshiyuki, Kazuhiko, 4,441,755, Cl. 296-93.000.
Ezoe, Mitsuhiko, 4,441,359, Cl. 73-117.000.
Ito, Hideo; and Irie, Namio, 4,441,572, Cl. 180-140.000.
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, 4,442,337, Cl. 219-117.100.
Oda, Takaaki; and Otsuka, Hidehiro, 4,441,681, Cl. 248-475.100.
Suzuki, Kunihiko, 4,441,575, Cl. 180-248.000.
Takagishi, Haruyoshi; Kamio, Kazuyoshi; and Fujikawa, Tsuneo, 4,441,645, Cl. 228-47.000.
Takeuchi, Yasuhisa, 4,441,405, Cl. 98-201.000.
Umezawa, Hidetsugu; Ogasawara, Takashi; and Shimazaki, Haruo, 4,441,531, Cl. 139-452.000.
Yoneda, Kenji; Sanezawa, Fumio; Takagi, Yasuo; and Ushijima, Yuji, 4,441,468, Cl. 123-198.00E.
Nisshin Steel Co., Ltd.: *See*—
Muranaka, Yutaka; and Sadahiro, Haruji, 4,441,543, Cl. 164-491.000.
Nitschke, John S., to Glasstech, Inc. Apparatus and method for locally heating conveyed glass sheets. 4,441,907, Cl. 65-106.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Sunakawa, Makoto; Moroishi, Yutaka; and Mune, Isao, 4,442,258, Cl. 524-767.000.
Niwa, Susumu; and Koike, Masao, to Kabushiki Kaisha Hosokawa Yoko. Process for sealing glass container openings. 4,442,129, Cl. 426-399.000.
Noda, Akinori; Miyasaka, Seiichi; and Kawahara, Hiroshi, to Asahi Glass Company, Ltd. Alkyl ether methylolmelamine coating composition, coating process and transparent product. 4,442,177, Cl. 428-412.000.
Noguchi, Kesao, to Nippon Electric Co., Ltd. Method for preparing a thin film amorphous silicon having high reliability. 4,441,973, Cl. 204-192.00N.
Noma, Takumi: *See*—
Hayashi, Nobuhiko, 4,441,436, Cl. 110-315.000.
Nordling, Neal F., to Cardio-Pace Medical, Inc.; and Cardio-Pace Medical, Inc. Planar receiver antenna coil for programmable electromedical pulse generator. 4,441,498, Cl. 128-419.00P.
Northern Engineering Industries plc: *See*—
Emmett, James R., 4,442,229, Cl. 521-26.000.
Northern Telecom Limited: *See*—
Holmes, Gordon J., 4,441,647, Cl. 228-119.000.
Porter, John F.; Walling, Joerg-Heim J.; and Axiuk, Oleg, 4,441,961, Cl. 162-106.000.
Trumble, William P.; Martin, Ivan E.; and Berthiaume, Clement E., 4,441,213, Cl. 2-161.00R.
Northwest Blueprint & Supply Co.: *See*—
Pelis, Giovanni, 4,441,803, Cl. 354-299.000.
Norton, Larry A.: *See*—
West, Frank L.; and Norton, Larry A., 4,442,327, Cl. 200-51.00R.
Norwich Eaton Pharmaceuticals, Inc.: *See*—
Skuster, James R., 4,442,038, Cl. 260-455.00R.
Novak, Robert F., to Ford Motor Company. Partial pressure of oxygen sensor-II. 4,442,420, Cl. 338-34.000.
Nowacki, Ulrich G., to International Paper Company. Linkage for actuating a carton erecting apparatus. 4,441,377, Cl. 74-105.000.
Nozawa, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a semiconductor device employing element isolation using insulating materials. 4,441,941, Cl. 148-187.000.
Numata, Saburo, to Fuji Photo Optical Co., Ltd. Auto strobe control circuit. 4,442,381, Cl. 315-151.000.
Nusbaumer, Joseph M.: *See*—
Snyder, George H.; Snyder, George H., III; and Nusbaumer, Joseph M., 4,441,533, Cl. 141-59.000.
Obrascovs, Guntis: *See*—
Burns, Christopher D.; Obrascovs, Guntis; and Pipe, Andrew L., 4,441,265, Cl. 36-117.000.
Occidental Oil Shale, Inc.: *See*—
Hines, Alex E., 4,441,760, Cl. 299-2.000.
Hutchins, Ned M.; Studebaker, Irving G.; Kvapil, Rudolf; and Ricketts, Thomas E., 4,441,759, Cl. 299-2.000.
Ochiai, Kuniaki; Horii, Masami; and Aoki, Osamu, to Tokyo Electric Co., Ltd. Printing head of dot printer. 4,441,828, Cl. 400-124.000.
Oda, Takaaki; and Otsuka, Hidehiro, to Nissan Motor Company, Limited. Mounting apparatus for outside rear view mirror assembly. 4,441,681, Cl. 248-475.100.
Odawara, Yoji: *See*—
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Yoji, 4,442,006, Cl. 210-613.000.
O'Dell, Gary B., to Tektronix, Inc. Data synchronization system for graphic recording apparatus. 4,442,442, Cl. 346-136.000.
O'Donnell, Matthew, to General Electric Company. Collimation of ultrasonic linear array transducer. 4,441,503, Cl. 128-660.000.
Oelsch, Jurgen; Volk, Richard; and Claassen, Karl-Heinz, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co. Process for the manufacture of a contact mat. 4,442,055, Cl. 264-105.000.
Ofenloch, Roland: *See*—
Michel, Helmut; Kampe, Wolfgang; and Ofenloch, Roland, 4,442,295, Cl. 548-505.000.

Ofstein, David E.: *See*—
Neiditch, David S.; Bullano, Gerald A.; DiLullo, Robert J.; and Ofstein, David E., 4,442,273, Cl. 526-88.000.
Ogasawara, Takashi: *See*—
Umezawa, Hidetsugu; Ogasawara, Takashi; and Shimazaki, Haruo, 4,441,531, Cl. 139-452.000.
Ohayashi, Hidehito: *See*—
Okamoto, Hiroshi; Seki, Michiharu; and Ohayashi, Hidehito, 4,441,981, Cl. 204-426.000.
Ohline Corporation: *See*—
Tsuhako, Parker I., 4,441,540, Cl. 160-168.00R.
Ohmori, Takashi: *See*—
Kurata, Masami; Moriguchi, Fujio; Ohmori, Takashi; and Makino, Katsuo, 4,442,452, Cl. 358-75.000.
Ohno, Shoichi: *See*—
Miyake, Toshio; Ohno, Shoichi; and Sakai, Shuzo, 4,442,209, Cl. 435-119.000.
Ohta, Kozo: *See*—
Kohyama, Mikihiro; and Ohta, Kozo, 4,441,574, Cl. 180-219.000.
Ohta, Yumiko: *See*—
Felix, Arthur M.; Ishitsuka, Hideo; Meienhofer, Johannes A.; and Ohta, Yumiko, 4,442,031, Cl. 260-112.50R.
Ohtsubo, Yoshiaki: *See*—
Kazami, Kazuyuki; and Ohtsubo, Yoshiaki, 4,441,774, Cl. 315-241.00P.
Okabe, Shinsei: *See*—
Murata, Michihiro; Kitao, Shoichi; and Okabe, Shinsei, 4,442,422, Cl. 338-35.000.
Okamoto, Hiroshi; Seki, Michiharu; and Ohayashi, Hidehito, to Hitachi, Ltd. Gas sensor. 4,441,981, Cl. 204-426.000.
Okamoto, Kouichi; Sakuyama, Masaki; and Tanaka, Mitsuo, to Mitsubishi Denki Kabushiki Kaisha. Rotor of a superconductive rotary electric machine. 4,442,369, Cl. 310-214.000.
Okano, Shuji: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,442,062, Cl. 264-518.000.
Okayama Paper Mill Co., Ltd.: *See*—
Sumi, Masao; Suenaga, Junichi; Takenaka, Masazo; Murano, Itaru; Tanabe, Mikio; and Hirai, Kiyoshi, 4,442,252, Cl. 524-183.000.
Okazaki, Hiroshi: *See*—
Shirasaki, Shinji; Tsuzuki, Yoshihiko; Hirabayashi, Yuzi; Okazaki, Hiroshi; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,442,424, Cl. 340-52.00F.
Oki Electric Industry Co., Ltd.: *See*—
Kotani, Shintaro; Abiko, Ichimatsu; Arae, Takashi; Chiba, Mio; Araki, Tomoo; and Kanno, Hiromasa, 4,442,429, Cl. 340-786.000.
Okumura, Mitsuhiro: *See*—
Takada, Syun; Kadowaki, Takashi; Okumura, Mitsuhiro; Nakamura, Shinichi; and Iwagaki, Masaru, 4,442,201, Cl. 430-569.000.
Okutu, Toshimitu: *See*—
Sato, Masami; Akashi, Goro; Okuzawa, Yasutoshi; and Okutu, Toshimitu, 4,442,171, Cl. 428-336.000.
Okuzawa, Yasutoshi: *See*—
Sato, Masami; Akashi, Goro; Okuzawa, Yasutoshi; and Okutu, Toshimitu, 4,442,171, Cl. 428-336.000.
O'Leary, Richard P.; and Reichgott, David W., to Betz Entec, Inc. Boiler water treatment. 4,442,009, Cl. 210-697.000.
Olhausen, James N., Jr., to General Dynamics Corporation. Training evaluation process. 4,442,491, Cl. 364-454.000.
Olin Corporation: *See*—
Ford, James M., 4,441,977, Cl. 204-252.000.
Pryor, Michael J.; and Sevier, Peter E., 4,441,542, Cl. 164-485.000.
Olson, Gary L.: *See*—
Berger, Leo; and Olson, Gary L., 4,442,291, Cl. 546-150.000.
Olson, Mark J. Biblical game. 4,441,718, Cl. 273-254.000.
Olsson, O. A. Torsten; Svensson, Leif Å; and Wetterlin, Kjell I. L., to Aktiebolaget Draco. Therapeutically active compounds. 4,442,300, Cl. 560-66.000.
Olympus Optical Co., Ltd.: *See*—
Esomoto, Fujio, 4,441,799, Cl. 354-145.100.
Nishikawa, Masaji, 4,442,191, Cl. 430-55.000.
Suzuki, Nobuyoshi, 4,441,374, Cl. 73-864.120.
Omco Inc.: *See*—
Nielsen, Anker J., Jr.; and Hoyt, Richard E., 4,441,343, Cl. 70-34.000.
OMI International Corporation: *See*—
Tremmel, Robert A., 4,441,969, Cl. 204-49.000.
Omori, Takashi: *See*—
Kikuchi, Yoshiki; Omori, Takashi; Moriguchi, Haruhiko; Moriguchi, Fujio; and Murayama, Tomio, 4,442,441, Cl. 346-74.400.
Onda, Tsutomu; Kano, Keiichi; and Itakura, Shinji, to Aisin Seiki Kabushiki Kaisha. Electroplating apparatus and method. 4,441,966, Cl. 204-26.000.
Onofrio, Armadio J.: *See*—
Dubar, Kenneth W.; and Onofrio, Armadio J., 4,441,711, Cl. 273-54.00B.
Oostenbrink, Albertus A.; Negeu, Anno G.; and van Kaam, Marinus L. G., to Wavin B.V. Branch pipe part. 4,441,744, Cl. 285-162.000.
Optimetrix Corporation: *See*—
Phillips, Edward H., 4,442,388, Cl. 318-640.000.
Orion Industries, Inc.: *See*—
Segal, William J., 4,441,762, Cl. 301-37.00R.
Osaka, Fukunobu, to Fujitsu Limited. Avalanche photodiodes. 4,442,444, Cl. 357-13.000.
Osawa, Michitaka: *See*—
Maekawa, Hitoshi; Osawa, Michitaka; and Ando, Kunio, 4,442,384, Cl. 315-399.000.
Osawa, Nobuyuki: *See*—
Kasai, Shinichi; Nakagawa, Sotoji; and Osawa, Nobuyuki, 4,441,765, Cl. 308-6.00C.
Osawa Press Mfg., Co., Ltd.: *See*—
Hara, Akinori, 4,441,386, Cl. 81-9.510.
Osborn, Thomas W., III, to Procter & Gamble Company, The. Soft, absorbent tissue paper. 4,441,962, Cl. 162-111.000.
Osborne, Robert L. Automated ultrasonic solution viscometer. 4,441,358, Cl. 73-55.000.
Osborne, Theodore M.: *See*—
Blom, Sture R.; and Osborne, Theodore M., 4,442,349, Cl. 250-222.100.
Oshima, Hiroyo; Daisaku, Matsukuma; Yutaka, Kojima; Yukio, Kobayashi; and Koichi, Nagai, to Jujo Paper Co., Ltd. Ink jet recording sheet. 4,442,172, Cl. 428-342.000.
Oshita, Youichi; Sato, Shunji; Takahashi, Takeshi; and Hirasawa, Kunio, to Hitachi, Ltd. Puffer type current interrupter. 4,442,330, Cl. 200-148.00A.
Oshkin, Anatoly I.; Banov, Mikhail D.; and Chernyshev, Alexandr N. End piece of bipolar water-cooled cable. 4,442,312, Cl. 174-15.0WF.
Osmonics, Inc.: *See*—
Smith, Zan P.; and Haimbach, Frank, IV, 4,442,004, Cl. 210-448.000.
Ostroski, Joseph; and Briski, Lawrence M. Electronic coin verification mechanism. 4,441,602, Cl. 194-100.00A.
Ota, Hideo; and Kubo, Yutaka, to Hitachi, Ltd. Dynamically buffered data transfer system for large capacity data source. 4,442,485, Cl. 364-200.000.
Ota, Shingo: *See*—
Nakahara, Teruo; Ota, Shingo; and Nakamura, Masaru, 4,441,596, Cl. 192-13.00R.
Otaka, Tetsuo: *See*—
Matsumura, Sowjun; Araki, Ken; Otaka, Tetsuo; and Tanigawa, Masumi, 4,441,965, Cl. 204-16.000.
Otis Engineering Corporation: *See*—
Setterberg, John R., Jr.; and Patel, Dhirajlal C., 4,441,553, Cl. 166-138.000.
Welch, William R.; and Heard, Thomas J., 4,441,558, Cl. 166-317.000.
Otsuka, Hidehiro: *See*—
Oda, Takaaki; and Otsuka, Hidehiro, 4,441,681, Cl. 248-475.100.
Otten, Joachim W., deceased: *See*—
Meininger, Fritz; Otten, Joachim W., deceased; Otten, Ursla, heir; and Rudolph, Anna G., heir, 4,442,288, Cl. 544-189.000.
Otten, Ursla, heir: *See*—
Meininger, Fritz; Otten, Joachim W., deceased; Otten, Ursla, heir; and Rudolph, Anna G., heir, 4,442,288, Cl. 544-189.000.
Otting, Billy J., to Otting International, Inc. Apparatus for treating textile materials. 4,441,341, Cl. 68-205.00R.
Otting International, Inc.: *See*—
Otting, Billy J., 4,441,341, Cl. 68-205.00R.
Otto, Josef: *See*—
Zolner, Dieter H.; Rittmann, Friedrich; Dung, Herbert; Haremsa, Johannes; Bauer, Georg; Otto, Josef; Muhlenbeck, Josef; and Lauterbach-Dammler, Inge, 4,442,525, Cl. 373-93.000.
Ouchi, Hiromu; Kawashima, Syunichiro; Nishida, Masamitsu; and Ueda, Ichiro, to Matsushita Electric Industrial Co., Ltd. Dielectric ceramics. 4,442,220, Cl. 501-139.000.
Overhoff, Heinz-Juergen: *See*—
Brandstetter, Franz; Hambrecht, Juergen; Stephan, Rudolf; Overhoff, Heinz-Juergen; Schwaab, Josef; Bernhard, Claus; Swoboda, Johann; and Echte, Adolf, 4,442,263, Cl. 525-83.000.
Owen, Donald R.: *See*—
Jacobus, Otha J.; and Owen, Donald R., 4,442,421, Cl. 338-35.000.
Owens-Corning Fiberglas Corporation: *See*—
Bhatti, Mohinder S., 4,441,903, Cl. 65-1.000.
Bhatti, Mohinder S., 4,441,904, Cl. 65-1.000.
Daws, John W.; Bradley, Hugh W., Jr.; and Canfield, Sheldon A., 4,441,367, Cl. 73-597.000.
Harris, David A., 4,441,402, Cl. 98-40.00C.
Propster, Mark A.; Seng, Stephen; and Hohman, Charles M., 4,441,906, Cl. 65-27.000.
Owens-Illinois, Inc.: *See*—
Zauner, Otto, 4,441,908, Cl. 65-109.000.
Owens, James H., III, to Armco Inc. Connectors for securing members together under large clamping. 4,441,742, Cl. 285-18.000.
Oxford Hill, Ltd.: *See*—
Thiele, Geraldine H., 4,442,125, Cl. 424-318.000.
Packaging Corporation of America: *See*—
Nederveld, Terril L., 4,441,649, Cl. 229-38.000.
Packo, Joseph J.; and Bailey, Donald L., to Packo, Joseph J. Self-sealing refrigerant. 4,442,015, Cl. 252-68.000.
Padron, Tamara: *See*—
Ruppert, Ronald M.; and Padron, Tamara, 4,441,881, Cl. 8-137.000.
Pagnoni, Giorgio, to F.Ili Pagnoni S.p.A. Double opening press for manufacturing wood chipboard and fibre-board or their substitutes, provided with four heating platens, in which the two central platens are separated by a rigid plate. 4,441,877, Cl. 425-338.000.
Pai, Damodar M., to Xerox Corporation. Photoresponsive device containing an electron donating layer. 4,442,192, Cl. 430-59.000.
Pang, Peter N. C.; and Rozhansky, Boris, to Siemens-Allis, Inc. Solid state trip circuit with digital timer. 4,442,472, Cl. 361-96.000.

Panster, Peter; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Polymeric rhodium, iridium and ruthenium phosphine complex compounds, processes for their production and use. 4,442,040, Cl. 260-429.00R.

Paparatto, Giuseppe: *See*—
Gozzo, Franco; Caprara, Giuseppe; Roberti, Lamberto; Paparatto, Giuseppe; and Santoro, Ettore, 4,442,301, Cl. 560-124.000.

Paragon Resources, Inc.: *See*—
Grudich, George, 4,441,653, Cl. 236-93.00R.

Parent, James R., to NDM Corporation. Medical electrode. 4,441,501, Cl. 128-641.000.

Parker, Alan; and Clough, Douglas O., to Hollingsworth (U.K.) Limited. Friction spinning apparatus. 4,441,310, Cl. 57-401.000.

Parks, James E.: *See*—
Hurst, G. Samuel; Parks, James E.; and Schmitt, Harold W., 4,442,354, Cl. 250-281.000.

Parrish, Henry H., Jr.; and Srinivasagopalan, Rangarajan, to Racal Data Communications Inc. Digital transmitter with vector component addressing. 4,442,530, Cl. 375-67.000.

Passmore, David T.; Wooten, Willis C.; and McBride, Paul, to Eastman Kodak Company. Thermosetting powder coating compositions. 4,442,270, Cl. 525-440.000.

Patel, Dhirajlal C.: *See*—
Setterberg, John R., Jr.; and Patel, Dhirajlal C., 4,441,553, Cl. 166-138.000.

Patten, Kenneth S. Internal combustion engine or pumping device. 4,441,587, Cl. 188-70.00R.

Paudler, Franklin T. Universal suture passer. 4,441,497, Cl. 128-339.000.

Paul, Raymond: *See*—
Zasio, John; Cooke, Larry; and Paul, Raymond, 4,442,361, Cl. 250-491.100.

Paul, Reiner: *See*—
Rasshofer, Werner; Schafer, Hermann; Paul, Reiner; and Beuth, Josef, 4,442,236, Cl. 521-130.000.

Pauliukonis, Richard S. O-ring solenoid valve. 4,441,687, Cl. 251-139.000.

Paulsen, Hans: *See*—
Kolar, Cenek; Paulsen, Hans; and Jacquinet, Jean C., 4,442,284, Cl. 536-17.900.

Pawlikowski, Walter W.: *See*—
Marquart, Vernon W.; and Pawlikowski, Walter W., 4,441,228, Cl. 15-229.0BP.

Pawlowski, Thomas D., to James River-Dixie/Nortern, Inc. Display carton. 4,441,608, Cl. 206-45.140.

Pawnee Products,Inc.: *See*—
Scheer, Daniel J., 4,441,456, Cl. 119-45.00R.

Payrhammer, Bernd: *See*—
Bartel, Siegfried; Ermer, Wolfgang; and Payrhammer, Bernd, 4,441,667, Cl. 242-197.000.

Pelis, Giovanni, to Northwest Blueprint & Supply Co. Diazo copy machine with ammonia fume eliminator. 4,441,803, Cl. 354-299.000.

Pento, Joseph T.: *See*—
Magarian, Robert A.; and Pento, Joseph T., 4,442,119, Cl. 424-274.000.

Perrin, Christian: *See*—
Bertails, Jean-Claude; and Perrin, Christian, 4,442,398, Cl. 323-315.000.

Perry, Ralph A.: *See*—
Andrejasich, Raymond J.; and Perry, Ralph A., 4,442,405, Cl. 324-439.000.

Pessier, Rudolf C. O.; Ippolito, Rodolfo M.; and Baker, Billy E., to Hughes Tool Company. Drill bit with dispersed cutter inserts. 4,441,566, Cl. 175-374.000.

Petasis, Nicos A.: *See*—
Nicolaou, Kyriacos C.; Petasis, Nicos A.; and Seitz, Steven P., 4,442,099, Cl. 424-248.570.

Peters, Charles F.: *See*—
Morrell, Roberto I.; and Peters, Charles F., 4,442,081, Cl. 423-321.00R.

Peters, Lester L., to Cummins Engine Company, Inc. Fuel injector assembly including a blow-back prevention cam. 4,441,654, Cl. 239-89.000.

Petersen, Godber: *See*—
Heckler, Hatto; Petersen, Godber; and Frick, Alfons, 4,441,390, Cl. 83-154.000.

Peterson, Donald A.; and Skrzypczak, Henry K., to Stoelting Company. Electronic cuff to monitor blood pressure in polygraph instruments. 4,441,504, Cl. 128-686.000.

Peterson, Donny L.; and Butts, Michael L., to Tipton, William E., Jr. Silver recovery unit. 4,441,697, Cl. 266-170.000.

Peterson, Lester W. Recreational apparatus. 4,441,220, Cl. 5-431.000.

Petri, Bernd: *See*—
Stadler, Werner; and Petri, Bernd, 4,441,516, Cl. 133-8.00A.

Petrolite Corporation: *See*—
Redmore, Derek, 4,442,286, Cl. 544-178.000.

Petrozello, James R., to International Business Machines Corporation. Rotary fiber optic switch. 4,441,785, Cl. 350-96.200.

Petruschke, John W.: *See*—
Wright, Andrew C. W.; and Petruschke, John W., 4,441,843, Cl. 411-349.000.

Pfeifer, Friedrich; and Kessler, Willi, to Vacuumschmelze GmbH. Method for producing toroidal tape cores for fault current safety switches and use of such cores. 4,441,940, Cl. 148-121.000.

Pfeifer, George F.; Koonce, George R.; and Phillips, Jack E., to General Electric Company. Optoelectronic incremental position encoder. 4,442,351, Cl. 250-237.00G.

Pfizer Inc.: *See*—
Belletire, John L.; and Sarges, Reinhard, 4,442,114, Cl. 424-267.000.

Pfordt, Hartwig: *See*—
Damm, Horst; and Pfordt, Hartwig, 4,441,570, Cl. 180-9.620.

Pharos AB: *See*—
Wickman, Kjell J., 4,441,818, Cl. 356-372.000.

Philip Morris Incorporated: *See*—
Edwards, William B., III, 4,442,292, Cl. 546-281.000.

Phillips, Edward H., to Hidden Valley Associates. Apparatus for sonically facilitating the cleaning of oil storage and transport vessels. 4,441,517, Cl. 134-113.000.

Phillips, Edward H., to Optimetrix Corporation. X-Y Addressable workpiece positioner having an improved X-Y address indicia sensor. 4,442,388, Cl. 318-640.000.

Phillips, Jack E.: *See*—
Pfeifer, George F.; Koonce, George R.; and Phillips, Jack E., 4,442,351, Cl. 250-237.00G.

Phillips Petroleum Company: *See*—
Haws, John R., 4,442,265, Cl. 525-91.000.
Kimble, James B., 4,441,992, Cl. 208-251.00H.
Likins, Merle R., Jr.; and Stacy, Galen D., 4,442,069, Cl. 422-62.000.
Martin, Joel L., 4,442,275, Cl. 526-96.000.
Martin, Joel L., 4,442,277, Cl. 526-125.000.
McDaniel, Max P.; and Johnson, Marvin M., 4,442,274, Cl. 526-95.000.

Pichler, Gerald P., to Federal-Mogul Corporation. Rotary bidirectional dynamic shaft seal having a pumping projection with angulated primary and secondary pumping surfaces. 4,441,722, Cl. 277-134.000.

Pickering, John; Woodhouse, Ian; and Ganendran, Arasipillai N., to BTR Limited. Method of and apparatus for repairing a leak in a pipe or pipeline. 4,442,053, Cl. 264-36.000.

Pielkenrood, Jacob, to Pielkenrood-Vinitex Beheer B.V. Easily transportable water purification device. 4,442,000, Cl. 210-256.000.

Pielkenrood-Vinitex Beheer B.V.: *See*—
Pielkenrood, Jacob, 4,442,000, Cl. 210-256.000.

Pierick, Mark W.: *See*—
Foster, David I.; Scott, Paul T.; Pierick, Mark W.; and Shaddock, Clarence L., Jr., 4,442,077, Cl. 423-210.000.

Pines, Michael Y., to Hughes Aircraft Company. Charge coupled device focal zoom. 4,442,457, Cl. 358-213.000.

Pioneer Electronic Corporation: *See*—
Ikedo, Yuji, 4,442,467, Cl. 360-105.000.
Isaki, Mikio, 4,442,466, Cl. 360-75.000.
Yoshida, Satoshi; and Higashi, Hidejiro, 4,442,323, Cl. 179-110.00A.

Pipe, Andrew L.: *See*—
Burns, Christopher D.; Obrascovs, Guntis; and Pipe, Andrew L., 4,441,265, Cl. 36-117.000.

Piper, Douglas E., to Woven Electronics Corporation. Shielded woven cable assembly and method of making same. 4,442,314, Cl. 174-36.000.

Pipkin, David J., to International Business Machines Corporation. Method for forming a coating on a substrate. 4,442,144, Cl. 427-355.000.

Pischtschan, Alfred: *See*—
Zabrocki, Karl; and Pischtschan, Alfred, 4,442,264, Cl. 525-86.000.

Pitney Bowes: *See*—
Buan, Danilo P.; and Navok, Ezra, 4,441,420, Cl. 101-69.000.

Pitney Bowes Inc.: *See*—
Eckert, Alton B., Jr.; and Duwel, Edward C., 4,442,501, Cl. 364-900.000.

Plan-Sell Oy: *See*—
Vartiainen, Jorma, 4,441,537, Cl. 144-357.000.

Plank, Herr A.: *See*—
Heuschmann, Herr F.; and Plank, Herr A., 4,442,426, Cl. 340-539.000.

Plapp, Gunther: *See*—
Kratt, Alfred; Kraus, Bernd; and Plapp, Gunther, 4,441,471, Cl. 123-339.000.

Platten, Myron G.: *See*—
Alter, Hobart L.; Wake, Lewis F.; and Platten, Myron G., 4,441,447, Cl. 114-167.000.

Plattner Industries, Inc.: *See*—
Cannon, John P., 4,441,336, Cl. 62-457.000.

PMP Corporation: *See*—
Massey, David H., 4,441,944, Cl. 156-71.000.

Poff, Wayne R.; and Bartch, Donald W., to RCA Corporation. Method for selectively etching integral cathode substrate and support. 4,441,957, Cl. 156-656.000.

Pohl, Herbert A., to D.E.P. Systems, Inc. Apparatus for electrofusion of biological particles. 4,441,972, Cl. 204-180.00R.

Pohl, Rudolph L., to Hercules Incorporated. Photopolymer compositions for printing plates. 4,442,302, Cl. 204-159.230.

Pohl, Wolfgang: *See*—
Naumann, Johannes; Pohl, Wolfgang; and Forster, Karl-Heinz, 4,441,424, Cl. 101-248.000.

Pohlack, Hubert, to Jenoptik Jena GmbH. Resonance absorber. 4,441,789, Cl. 350-166.000.

Pohler, Carl-Ludwig. Testing installation for pipes having an internal testing unit driven by the rotation of the pipe. 4,442,403, Cl. 324-220.000.

Pohlmann, Juergen L. W.; and Martinka, Michael, to United States of America, Army. Method of passivating mercury cadmium telluride using modulated DC anodization. 4,441,967, Cl. 204-29.000.

Polaroid Corporation: *See*—
Bartels-Keith, James R.; and Puttick, Anthony J., 4,442,290, Cl. 544-310.000.

Poliak, Richard M.; Rivenburgh, Dennis L.; and Sambucetti, Carlos J., to International Business Machines Corporation. Soldering flux. 4,441,938, Cl. 148-23.000.

Pollack, Frederick J.: *See*—
Childs, Robert H. E., Jr.; Kiebanoff, Jack L.; and Pollack, Frederick J., 4,442,484, Cl. 364-200.000.

Pomagalski S.A.: *See*—
Brochand, Max, 4,441,430, Cl. 104-209.000.

Ponczek, George M., to Stewart-Warner Corporation. Gearbox drive for a speedometer. 4,441,378, Cl. 74-414.000.

Pond, Stanley L.: *See*—
Ludwick, Sandra L.; Pond, Stanley L.; and Rhodes, Robert T., 4,442,356, Cl. 250-324.000.

Ponomarev, Ivan K.: *See*—
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,441,648, Cl. 229-37.00R.

Pont-a-Mousson SA: *See*—
Malivoir, Roger; and Mayer, Gilbert, 4,441,847, Cl. 414-31.000.

Poole, A. Robin; Mort, John S.; and Recklies, Anneliese D., to Shriners Hospitals for Crippled Children. Tumor enzyme detection. 4,442,088, Cl. 424-85.000.

Porter Equipment Co.: *See*—
Schroeder, Edward A.; and Donat, William F., 4,441,709, Cl. 273-1.50R.

Porter, John F.; Walling, Joerg-Heim J.; and Axiuk, Oleg, to Northern Telecom Limited. Pulp insulated telecommunications conductor. 4,441,961, Cl. 162-106.000.

Portsmouth, Joseph P., to Nabisco Brands, Inc. Single piece packaging container. 4,441,648, Cl. 229-37.00R.

Potts, Gerald R.: *See*—
Sekula, Paul J.; and Potts, Gerald R., 4,442,499, Cl. 364-574.000.

Pounds, Douglas W., to Leland Stanford Jr. University, Board of Trustees of. Hyperthermia system. 4,441,486, Cl. 128-24.00A.

Powell, Philip G., to Eastman Kodak Company. Image processing method using a block overlap transformation procedure. 4,442,454, Cl. 358-167.000.

Powell, Thomas M., to General Motors Corporation. Supplementary fuel system for enhancing low temperature engine operation. 4,441,467, Cl. 123-179.00G.

Power Distribution, Inc.: *See*—
Van Sickle, Robert J., 4,442,385, Cl. 318-140.000.

Power, Harold H. Static line mixer. 4,441,823, Cl. 366-167.000.

Powers, Charles A.; and Holman, George B., to Standard Oil Company. Diverter tool and its use. 4,441,556, Cl. 166-290.000.

Pownall, Colin S.; and Spencer, Joseph L., to Pownall Spencer Engineering, Ltd. Drying apparatus. 4,441,880, Cl. 432-13.000.

Pownall Spencer Engineering, Ltd.: *See*—
Pownall, Colin S.; and Spencer, Joseph L., 4,441,880, Cl. 432-13.000.

Precision Fukuhara Works, Ltd.: *See*—
Yorisue, Shozo, 4,441,339, Cl. 66-111.000.

Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See*—
Oelsch, Jurgen; Volk, Richard; and Claassen, Karl-Heinz, 4,442,055, Cl. 264-105.000.

Prescher, Gunter: *See*—
Arntz, Dietrich; Prescher, Gunter; and Heilos, Johannes, 4,442,308, Cl. 568-480.000.

Preslar, Donald R., to RCA Corporation. Push-pull non-complementary transistor amplifier. 4,442,409, Cl. 330-274.000.

Presray Corporation, The: *See*—
Covey, George H., III, 4,441,278, Cl. 49-477.000.

Presti, Frank P.: *See*—
Lipschutz, Lewis D.; Meagher, Ralph E.; and Presti, Frank P., 4,442,450, Cl. 357-81.000.

Price, Abner B.; and Burnley, William S., III, to United States of America, Navy. Retainer for a projectile rotating band. 4,441,429, Cl. 102-526.000.

Price, Barry J.: *See*—
Clitherow, John W.; Bradshaw, John; Mackinnon, John W. M.; Price, Barry J.; Martin-Smith, Michael; and Judd, Duncan B., 4,442,110, Cl. 424-263.000.

Pride, Carol F.: *See*—
Malmendier, Joseph W.; Pride, Carol F.; Rhoads, Randy L.; Schlaufman, Robert J.; and Shoup, Robert D., 4,441,905, Cl. 65-21.300.

Priegnitz, James W.: *See*—
Neuzil, Richard W.; and Priegnitz, James W., 4,442,285, Cl. 536-127.000.

Priel, Ury; Yaron, Giora; and Ebel, Mark S., to National Semiconductor Corporation. Semiconductor memory byte clear circuit. 4,442,510, Cl. 365-218.000.

Prinz, Peter: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,442,304, Cl. 560-232.000.

Prinzbach, Horst; Schwesinger, Reinhard; and Keller, Reinhold, to BASF Aktiengesellschaft. Diepoxycyclohexane derivatives. 4,442,299, Cl. 549-545.000.

Probst, Joachim; Riberi, Bernd; Kolb, Gunter, deceased (by Kolb, Ingeborg, heiress); and Hohlein, Peter, to Bayer Aktiengesellschaft. Process for coating substrates with polyisocyanates and polyhydroxy polyacrylates. 4,442,145, Cl. 427-385.500.

Procter & Gamble Company, The: *See*—
Ahr, Nicholas A.; and Moret, David M., 4,441,212, Cl. 2-49.00R.
Leonard, Edward F., 4,441,947, Cl. 156-158.000.
Mullane, William I., Jr., 4,441,952, Cl. 156-222.000.
Osborn, Thomas W., III, 4,441,962, Cl. 162-111.000.

Profoment Utvecklings AB: *See*—
Ericsson, Axel B. R., 4,441,292, Cl. 52-309.700.

Proksa, Ferdinand; Sulzbach, Hans-Michael; and Raffel, Reiner, to Maschinenfabrik Hennecke GmbH. Apparatus for the production of a flowable reaction mixture. 4,442,070, Cl. 422-133.000.

Propster, Mark A.; Seng, Stephen; and Hohman, Charles M., to Owens-Corning Fiberglas Corporation. Method of preheating glass batch. 4,441,906, Cl. 65-27.000.

Pryor, Michael J.; and Sevier, Peter E., to Olin Corporation. Process for cooling and solidifying continuous or semi-continuously cast material. 4,441,542, Cl. 164-485.000.

Pryor, Timothy R., to Diffracto Ltd. Electro-optical sensors with fiber optic bundles. 4,441,817, Cl. 356-375.000.

Purdum, William R., to Monsanto Company. Process for preparing monoesters and diesters of N-alkyl substituted amino methyl phosphonic acid. 4,442,044, Cl. 260-969.000.

Puttick, Anthony J.: *See*—
Bartels-Keith, James R.; and Puttick, Anthony J., 4,442,290, Cl. 544-310.000.

Q-dot Corporation: *See*—
McCurley, Jack, 4,441,544, Cl. 165-1.000.

Quantz, James B., to Machine Design Incorporated. Cracking die assembly for high production nut cracking apparatus. 4,441,414, Cl. 99-571.000.

Quartz et Silice: *See*—
Guerder, Pierre; and Ranson, Andre, 4,441,788, Cl. 350-96.340.

Quigley, William L. Electronic navigation method and system. 4,442,432, Cl. 343-394.000.

Quinlan, James M., to American Cyanamid Company. Diethylcarbamazine resinate and styrylpyridinium resinate-diethylcarbamazine resinate edible anthelmintic tablets for companion animals. 4,442,086, Cl. 424-79.000.

R & D Associates: *See*—
Latter, Albert L.; Hammond, R. Philip; and Dooley, James L., 4,442,065, Cl. 376-280.000.
Ridgway, Stuart L., 4,441,321, Cl. 60-641.700.

R. D. Design Co., Inc.: *See*—
Daugherty, Carol A.; Siebens, Larry N.; and Daugherty, Ronald R., 4,441,487, Cl. 128-24.200.

R. W. Simon Limited: *See*—
Simon, Johnathan G., 4,441,404, Cl. 98-96.000.

Racal Data Communications Inc.: *See*—
Parrish, Henry H., Jr.; and Srinivasagopalan, Rangarajan, 4,442,530, Cl. 375-67.000.

Racal Research Limited: *See*—
Munday, Peter J., 4,442,527, Cl. 375-1.000.

Rado, Theodore A., to Kerr-McGee Chemical Corporation. Titanium ore chlorination process using a molten salt. 4,442,075, Cl. 423-76.000.

Raffel, Reiner: *See*—
Proksa, Ferdinand; Sulzbach, Hans-Michael; and Raffel, Reiner, 4,442,070, Cl. 422-133.000.

Raimondo, Michele: *See*—
Iemmi, Giuliano; Raimondo, Michele; and Mo, Luigi, 4,441,976, Cl. 204-224.00M.

Ramsden, Christopher A.; Knowles, Philip; Lewis, Edward J.; Lunt, Edward; and Wright, Derek E., to May & Baker Limited. 2'Hydroxy tetrazole-5-carboxanilides and anti-allergic use thereof. 4,442,115, Cl. 424-269.000.

Rand, Peter B., to United States of America, Energy. Stabilized aqueous foam systems and concentrate and method for making them. 4,442,018, Cl. 252-307.000.

Ranson, Andre: *See*—
Guerder, Pierre; and Ranson, Andre, 4,441,788, Cl. 350-96.340.

Rao, Basrur R., to Sperry Corporation. Short pulse generator. 4,442,362, Cl. 307-108.000.

Rappinger, Bo; and Stenkvist, Sven-Einar, to ASEA AB. Electric arc furnace arcing electrode seal. 4,442,526, Cl. 373-95.000.

Rashleigh, Scott C., to United States of America, Navy. Fiber optic sensor with enhanced immunity to random environmental perturbations. 4,442,350, Cl. 250-227.000.

Rasshofer, Werner; Schafer, Hermann; Paul, Reiner; and Beuth, Josef, to Bayer Aktiengesellschaft. Process for the production of molded articles. 4,442,236, Cl. 521-130.000.

Rathbone, Elner B.; Waites, Geoffrey M. H.; and Ford, William C. L., to Tate & Lyle Public Limited Company. 6-Chloro-6-deoxy-D-hexitols, compositions containing them and their use in fertility control. 4,442,123, Cl. 424-308.000.

Rattner, Manfred: *See*—
Baumann, Heinz; Kuhnel, Werner; and Rattner, Manfred, 4,442,483, Cl. 363-131.000.

Rau, Wolfgang; Klamann, Helmut; and Hennenberger, Peter, to BASF Aktiengesellschaft. Preparation of propylene homopolymers or copolymers. 4,442,271, Cl. 526-61.000.

Rautio, Kauko. Machine for hewing square timbers. 4,441,536, Cl. 144-39.000.

Raychem Corporation: *See*—
Brigham, Alan, 4,442,139, Cl. 427-122.000.

Raymond, Kenneth N.: *See*—
Weitl, Frederick L.; and Raymond, Kenneth N., 4,442,305, Cl. 562-451.000.

RCA Corporation: *See*—
Brauer, Eric A., 4,442,517, Cl. 369-71.000.
Carlson, David E.; and Williams, Brown F., 4,442,310, Cl. 136-256.000.
Hedlund, Lee V.; and Shields, Jerome D., 4,442,465, Cl. 360-130.230.
Ipri, Alfred C.; and Stewart, Roger G., 4,442,447, Cl. 357-41.000.
Kern, Werner, 4,442,134, Cl. 427-9.000.
Lehmann, William L., 4,442,548, Cl. 455-195.000.
Poff, Wayne R.; and Bartch, Donald W., 4,441,957, Cl. 156-656.000.
Preslar, Donald R., 4,442,409, Cl. 330-274.000.
Reitmeier, Glenn A.; and Strolle, Christopher H., 4,442,545, Cl. 382-56.000.
Smith, Edwin B.; and Craft, Richard A., 4,442,412, Cl. 331-1.000.
Tults, Juri, 4,442,547, Cl. 455-180.000.

Reber, Dwight E., to Columbia Helicopters, Inc. Cargo sling system for a helicopter. 4,441,750, Cl. 294-83.00R.

Recklies, Anneliese D.: *See*—
Poole, A. Robin; Mort, John S.; and Recklies, Anneliese D., 4,442,088, Cl. 424-85.000.

Reclamet, Inc.: *See*—
Dudley, Russell D., 4,441,995, Cl. 209-137.000.

Redmore, Derek, to Petrolite Corporation. Preparation of amines by the reduction of imines with phosphorous acid. 4,442,286, Cl. 544-178.000.

Redwine, Donald J., to Texas Instruments Incorporated. Method of making memory cell by selective oxidation of polysilicon. 4,441,246, Cl. 29-571.000.

Reed, Gordon A. D., to Liquid Carbonic Inc. Catalytic curing of coatings. 4,442,143, Cl. 427-340.000.

Reed, William G.: *See*—
Nagy, Alex J.; and Reed, William G., 4,442,131, Cl. 426-518.000.

Reeder, Dennis J.; Campbell, John S.; Kasunic, Keith J.; and Laiterman, Lee H., to Spectra-Physics, Inc. Multiple lever apparatus for positioning an optical element. 4,442,524, Cl. 372-107.000.

Reeves, William H.: *See*—
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,441,508, Cl. 128-736.000.

Rehberg, Bobby E., to Estech, Inc. Ethylene inhibition in plants. 4,441,918, Cl. 71-113.000.

Rehm, Russell H. Activated seawater wastewater treatment system. 4,442,007, Cl. 210-631.000.

Reich Spezialmaschinen GmbH: *See*—
Dettelbach, Alfred; and Henzler, Roland, 4,441,450, Cl. 118-681.000.

Reichgott, David W.: *See*—
O'Leary, Richard P.; and Reichgott, David W., 4,442,009, Cl. 210-697.000.

Reitmeier, Glenn A.; and Strolle, Christopher H., to RCA Corporation. Compaction of television display graphics in phantom-raster-scanned image memory. 4,442,545, Cl. 382-56.000.

Relvini, Pasquale: *See*—
Marciandi, Franco; and Relvini, Pasquale, 4,442,255, Cl. 524-414.000.

Relyea, John W.: *See*—
Alley, Robert P.; Relyea, John W.; and Sidebottom, Donald L., 4,441,545, Cl. 165-26.000.

Repa, Petr: *See*—
Emmer, Ivan; Hajek, Zdenek; and Repa, Petr, 4,441,968, Cl. 204-35.00N.

Republic Tool & Manufacturing Corporation: *See*—
McRoskey, Jack W., 4,441,395, Cl. 83-862.000.

Research Corporation: *See*—
Nicolaou, Kyriacos C.; Petasis, Nicos A.; and Seitz, Steven P., 4,442,099, Cl. 424-248.570.

Rest, Heinz; and Ufrecht, Martin, to Ford Motor Company. Container for fluids for operating functions in motor vehicles. 4,441,463, Cl. 123-41.270.

Revell, Alan E., to American Air Filter Company, Inc. Discharge apparatus for removing granular filter material from a filter housing and a filter apparatus having same. 4,441,898, Cl. 55-350.000.

Rexnord Inc.: *See*—
Ronco, Kenneth J.; and Stacey, Robert E., 4,441,605, Cl. 198-731.000.

Reynertson, Philip S., to Monsanto Company. Form for refractory-faced tube sheets. 4,442,052, Cl. 264-30.000.

Reynolds, John: *See*—
Canales, Manuel J.; and Reynolds, John, 4,442,083, Cl. 423-567.00R.

Reynolds, William V. Movement dampening ear speculum. 4,441,485, Cl. 128-9.000.

Rhoads, Randy L.: *See*—
Malmendier, Joseph W.; Pride, Carol F.; Rhoads, Randy L.; Schlaufman, Robert J.; and Shoup, Robert D., 4,441,905, Cl. 65-21.300.

Rhodes, Robert T.: *See*—
Ludwick, Sandra L.; Pond, Stanley L.; and Rhodes, Robert T., 4,442,356, Cl. 250-324.000.

Rhone-Poulenc Industries: *See*—
Bouverot, Noel; Medard, Paul; and Viale, Alain, 4,442,060, Cl. 264-328.200.

Riberi, Bernd: *See*—
Probst, Joachim; Riberi, Bernd; Kolb, Gunter, deceased; and Hohlein, Peter, 4,442,145, Cl. 427-385.500.

Rice, Lawrence M.: *See*—
Morris, Merle E.; Rice, Lawrence M.; and Meade, Steven L., 4,442,374, Cl. 313-316.000.

Richards, Richard D.: *See*—
Simon, William E.; and Richards, Richard D., 4,442,496, Cl. 364-524.000.

Richardson, Bryan D.; and Lewis, Shelton E., to Standard Oil Company (Indiana). Base cup applicator. 4,441,955, Cl. 156-423.000.

Ricketts, Thomas E.: *See*—
Hutchins, Ned M.; Studebaker, Irving G.; Kvapil, Rudolf; and Ricketts, Thomas E., 4,441,759, Cl. 299-2.000.

Rickman, Mark A.; and Leonard, Murray, to Vernitron Corporation. Ignition indicator for gas grills. 4,441,480, Cl. 126-42.000.

Ricoh Co. Ltd.: *See*—
Mizuno, Akinori, 4,442,439, Cl. 346-1.100.

Rideal, Graham R.: *See*—
Briggs, Peter J.; McAloon, Kevin; and Rideal, Graham R., 4,442,164, Cl. 428-283.000.

Ridgway, Stuart L., to R & D Associates. Compact mist flow power generator. 4,441,321, Cl. 60-641.700.

Riebli, Peter: *See*—
Kunz, Walter; Eckhardt, Wolfgang; Hubele, Adolf; and Riebli, Peter, 4,442,117, Cl. 424-273.00R.

Riedl, Haroid R.: *See*—
Bouley, Alan C.; Riedl, Harold R.; Jensen, James D.; and Jost, Steven R., 4,442,446, Cl. 357-30.000.

Rieger, Herbert. Horizontal container for processing wine grape must. 4,441,407, Cl. 99-277.200.

Riemer, Heinz: *See*—
Weiss, Jorn-Volker; Riemer, Heinz; and Mutzberg, Friedhelm, 4,442,245, Cl. 523-401.000.

Rijnders, Willem, to Hunter Douglas International N.V. Panelling and carriers therefor. 4,441,297, Cl. 52-478.000.

Riley, Robert E. Support for roof insulation in metal buildings and method for insulating the roof of such buildings. 4,441,294, Cl. 52-404.000.

Ritter, Ernst: *See*—
Fiedler, Helmut; and Ritter, Ernst, 4,441,868, Cl. 417-490.000.

Rittmann, Friedrich: *See*—
Zolner, Dieter H.; Rittmann, Friedrich; Dung, Herbert; Haremsa, Johannes; Bauer, Georg; Otto, Josef; Muhlenbeck, Josef; and Lauterbach-Dammler, Inge, 4,442,525, Cl. 373-93.000.

Ritzi, Emil W., to Transamerica Delaval Inc. Multi-stage, wet steam turbine. 4,441,322, Cl. 60-649.000.

Rivenburgh, Dennis L.: *See*—
Poliak, Richard M.; Rivenburgh, Dennis L.; and Sambucetti, Carlos J., 4,441,938, Cl. 148-23.000.

Riviana Foods, Inc.: *See*—
Autrey, Harry S.; and Hunnell, John W., 4,442,130, Cl. 426-462.000.

Rivkin, Bernard; and Wolfe, Marshall W. Anchor for a perforated board hanger. 4,441,680, Cl. 248-220.400.

Robert Bosch GmbH: *See*—
Andersson, Borje, 4,441,625, Cl. 220-257.000.
Fiedler, Helmut; and Ritter, Ernst, 4,441,868, Cl. 417-490.000.
Knorreck, Peter, 4,441,472, Cl. 123-383.000.
Kratt, Alfred; Kraus, Bernd; and Plapp, Gunther, 4,441,471, Cl. 123-339.000.
Seyffer, Siegfried, 4,441,686, Cl. 251-127.000.

Roberti, Lamberto: *See*—
Gozzo, Franco; Caprara, Giuseppe; Roberti, Lamberto; Paparatto, Giuseppe; and Santoro, Ettore, 4,442,301, Cl. 560-124.000.

Roberts, James E.; and Lenarth, Edward L. Charge air cooling system. 4,441,476, Cl. 123-542.000.

Roberts, Peter, to Thrush Incorporated. Tail-pipe replacement kit. 4,441,579, Cl. 181-243.000.

Roberts, Walter M., to Walton Energy Systems Co. Piezo electric apparatus for generating electricity. 4,442,372, Cl. 310-339.000.

Robertshaw Controls Company: *See*—
Wolfe, Denis G.; and Wada, Naohisa, 4,441,317, Cl. 60-527.000.

Robertson, Channing R.: *See*—
Michaels, Alan S.; Robertson, Channing R.; Cohen, Stanley N.; Inloes, Douglas S.; and Smith, William J., 4,442,206, Cl. 435-68.000.

Robinair Manufacturing Corporation: *See*—
Lower, Ralph C.; and Shirley, Roger D., 4,441,330, Cl. 62-149.000.

Robinson, Douglas J.; and Ette, Aniedi O., to University Patents, Inc. Separation and recovery of metal alloys from superalloy scrap. 4,442,073, Cl. 423-54.000.

Robinson, Frank: *See*—
Betts, Max W.; and Robinson, Frank, 4,441,338, Cl. 66-64.000.

Robinson, John D., Jr.: *See*—
Rotondo, Claude P.; and Robinson, John D., Jr., 4,441,311, Cl. 60-39.080.

Robinson, Richard C.: *See*—
Bishop, Keith C., III; Earls, David E.; Robinson, Richard C.; Blakely, Donald W., deceased; and Jacobson, Robert L., administrator, 4,442,221, Cl. 502-25.000.

Robinson, Robert J.; Johnson, David B.; and Schroeder, Verdell H., to AXIA Incorporated. Self-oiling portable bag-closing sewing machine with pump. 4,441,442, Cl. 112-256.000.

Robotic Vision Systems, Inc.: *See*—
Di Matteo, Paul; and Ross, Joseph, 4,441,854, Cl. 414-787.000.

Roch, Josef: *See*—
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,442,111, Cl. 424-263.000.

Rockwell International Corporation: *See*—
Malkowski, Joseph L.; and Wells, Calvin G., 4,441,379, Cl. 74-477.000.
Stehman, Carl J., 4,442,321, Cl. 179-18.0EB.
Rodriquez, Benjamin P.: *See*—
Duerksen, Charles J.; and Rodriquez, Benjamin P., 4,441,914, Cl. 71-95.000.
Rodzen, Richard A.: *See*—
Sessions, Robert W.; Jeslis, Jerome; and Rodzen, Richard A., 4,441,500, Cl. 128-641.000.
Roesler, Layton S. Drawer apparatus. 4,441,771, Cl. 312-322.000.
Roesner, Bruce B., to Burroughs Corporation. Electrically programmable read-only memory stacked above a semiconductor substrate. 4,442,507, Cl. 365-100.000.
Roesner, Raymond E.: *See*—
Carlson, Norman R.; Roesner, Raymond E.; and Lanuke, Edward W., 4,441,361, Cl. 73-155.000.
Rogers, Charles H.: *See*—
Amos, Lynn G.; and Rogers, Charles H., 4,442,218, Cl. 436-525.000.
Rogers Corporation: *See*—
Kosa, Bruce G., 4,442,234, Cl. 521-112.000.
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, to W. Schlafhorst & Co. Thread splicing device. 4,441,308, Cl. 57-22.000.
Rohr Industries, Inc.: *See*—
Rose, Philip M., 4,441,578, Cl. 181-222.000.
Rolls-Royce Limited: *See*—
Colley, Rowan H., 4,441,323, Cl. 60-737.000.
Sadler, John H. R., 4,441,859, Cl. 416-96.00A.
Romer, Dietmar, to Sandoz Ltd. Analgesic and myotonolytic preparations. 4,442,084, Cl. 424-251.000.
Ronco, Kenneth J.; and Stacey, Robert E., to Rexnord Inc. Two-piece snap-on flight for a conveyor chain. 4,441,605, Cl. 198-731.000.
Roob, Josef: *See*—
Blaschke, Kurt; and Roob, Josef, 4,441,749, Cl. 294-88.000.
Rood, William R., to C. L. Frost & Son, Inc. Plastic conveyor roller and method of making same. 4,441,601, Cl. 193-37.000.
Roos, Uwe V.: *See*—
Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., 4,442,063, Cl. 264-532.000.
Roquette Freres: *See*—
Gosset, Serge; and Huchett, Michael, 4,441,937, Cl. 148-18.000.
Rose, Philip M., to Rohr Industries, Inc. Encapsulated bulk absorber acoustic treatments for aircraft engine application. 4,441,578, Cl. 181-222.000.
Roses, Josh. Arithmetic unit for use in data processing systems. 4,442,498, Cl. 364-745.000.
Rosenbluth, Robert F.: *See*—
Ionescu, Marian I.; Lenker, Jay A.; and Rosenbluth, Robert F., 4,441,216, Cl. 3-1.500.
Rosentreter, Ulrich: *See*—
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Ross, James E., to S-Tec Corporation. Aircraft pitch stabilization apparatus. 4,442,490, Cl. 364-433.000.
Ross, Joseph: *See*—
Di Matteo, Paul; and Ross, Joseph, 4,441,854, Cl. 414-787.000.
Rossi, Cristiano, to Comau S.p.A. Side aperture welding assembly system. 4,442,335, Cl. 219-79.000.
Roth, Ernest R., to Biohol Corporation. Gasoline-aided production of alcohol and fuel. 4,441,891, Cl. 44-56.000.
Roth, Roger R., to United States of America, Air Force. Security system signal processor. 4,442,514, Cl. 367-136.000.
Rothamel, Karl, to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik. Apparatus and method for displaying unbalance of rotors during measurement. 4,441,355, Cl. 73-1.00R.
Rothbuhr, Lothar: *See*—
Kuhner, Gerhard; Wolff, Siegfried; and Rothbuhr, Lothar, 4,442,163, Cl. 428-262.000.
Rotondo, Claude P.; and Robinson, John D., Jr., to United Technologies Corporation. Means for controlling the air scavenge pressure in the bearing compartment of a gas turbine engine. 4,441,311, Cl. 60-39.080.
Rousseau, Jacques R.: *See*—
Aglae, Gilbert R.; Alavoine, Jacques J.; Contensou, Claude; Rousseau, Jacques R.; and Cerati, Celestin, 4,441,672, Cl. 244-110.00C.
Rowarth, Ralph, to British Aerospace Public Limited Company. Force control member assemblies. 4,441,676, Cl. 244-234.000.
Rowe, James S.; and Carless, John E., to Nicholas Proprietary Limited. Encapsulation of indomethacin. 4,442,051, Cl. 264-4.300.
Rozhansky, Boris: *See*—
Pang, Peter N. C.; and Rozhansky, Boris, 4,442,472, Cl. 361-96.000.
Rudolph, Anna G., heir: *See*—
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Ruhrkohle AG: *See*—
Bassier, Friedrich; and Goldschmidt, Klaus, 4,441,840, Cl. 405-267.000.
Rumbaugh, James T.: *See*—
McMickle, Robert L.; and Rumbaugh, James T., 4,441,273, Cl. 43-18.100.
Ruppert, Ronald M.; and Padron, Tamara, to Lever Brothers Company. Detergent compositions containing ethoxylated fatty alcohols with narrow ethylene oxide distributions. 4,441,881, Cl. 8-137.000.
Russell, Roy R. B.: *See*—
Colman, Geoffrey; and Russell, Roy R. B., 4,442,085, Cl. 424-49.000.
Rutledge, Gerald D.: *See*—
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Ryan, Robert C.: *See*—
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Ryazansky Radiotekhnichesky Institut: *See*—
Meer, Vadim V.; Nesterov, Vladimir I.; and Lapshin, Boris G., 4,442,511, Cl. 367-78.000.
Rydell, Nils; and Kalen, Ragnar. Aid for telescopic nail for orthopedic use. 4,441,492, Cl. 128-92.0EB.
Ryder, Francis E.: *See*—
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Ryder International Corporation: *See*—
Thomas, Michael D.; and Ryder, Francis E., 4,441,769, Cl. 312-270.000.
S-Tec Corporation: *See*—
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Saarberg-Fernwarme GmbH: *See*—
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Saari, Walfred S., to Merck & Co., Inc. Treating sedation with 1-(3-substituted-2-pyridinyl) piperazines. 4,442,103, Cl. 424-250.000.
SAB Industri AB: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,441,591, Cl. 188-202.000.
Sabourin, Paul F.: *See*—
Lessard, Dennis E.; and Sabourin, Paul F., 4,441,369, Cl. 73-602.000.
Sacks, Charles H. Two cycle safety razor. 4,441,253, Cl. 30-32.000.
Sacks, Clifford E., to Upjohn Company, The. Acyclic amine epoxide process. 4,442,035, Cl. 260-239.55R.
Sadahiro, Haruji: *See*—
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Saenz, Jesus A.: *See*—
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Saias, Edmond: *See*—
Le Polles, Jean-Bernard; Martin, Michel; Nadler, Guy; and Saias, Edmond, 4,442,108, Cl. 424-258.000.
St. Germain, Dennis. Strip thimble. 4,441,748, Cl. 294-74.000.
Saito, Junichi: *See*—
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Saito, Kazuo, to Tokico Ltd. Disc brake including a spring for pressing a friction pad against a guiding portion. 4,441,588, Cl. 188-73.380.
Saito, Kenichi: *See*—
Maeda, Yuji; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,442,093, Cl. 424-236.000.
Saito, Takahide; and Nakagawa, Yasuo, to Sumitomo Bakelite Company Limited. Mold apparatus for forming article under influence of magnetic field. 4,441,875, Cl. 425-3.000.
Saito, Takao; and Ezure, Kazuya, to Nippon Steel Corporation. Steel strip having differentiated multilayer coatings and being useful for manufacturing of cans. 4,442,181, Cl. 428-623.000.
Saito, Yoshinobu; and Sugimoto, Sakae, to Tohoku Tokushuko Kabushiki Kaisha. Material for semiconductor holder in electron beam writing apparatus. 4,442,067, Cl. 420-428.000.
Sakai, Shuzo: *See*—
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Sakurada, Okinobu, to Matsushita Electric Industrial Co., Ltd.; and Toyota Jidosha-Kogyo Kabushiki Kaisha. Vibration sensor. 4,441,370, Cl. 73-651.000.
Sakuyama, Masaki: *See*—
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Salina, Louis E.; and Lescovich, Joseph E., to GA Industries Inc. Pump failure protection for liquid transmission pipelines. 4,442,395, Cl. 320-48.000.
Sambucetti, Carlos J.: *See*—
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Samdal, Terje: *See*—
Larsen, Thor; and Samdal, Terje, 4,441,869, Cl. 418-51.000.
Sampson, Stephen A., to Allied Corporation. Patchcord connector. 4,441,778, Cl. 339-99.00R.
Sander, Jurgen: *See*—
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Sandoz, Inc.: *See*—
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Sandoz Ltd.: *See*—
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Muller-Schweinitzer, Else, 4,442,112, Cl. 424-263.000.
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Sanford, Doyle M. Bird feeder stand. 4,441,457, Cl. 119-51.00R.
Sanjurjo, Angel, to SRI International. Process for obtaining silicon from fluosilicic acid. 4,442,082, Cl. 423-350.000.
Sankin Industry Co., Ltd.: *See*—
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Sarges, Reinhard: *See*—
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Sarin, Vinod K.; and Buljan, Sergej-Tomislav, to GTE Laboratories Incorporated. Coated composite silicon nitride cutting tools. 4,441,894, Cl. 51-295.000.
Sarrailh, Jean-Paul: *See*—
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Sasazawa, Tatsuya: *See*—
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Sashiki, Takashi; Matsuno, Masaaki; Kobayashi, Noboru; and Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Weighing apparatus. 4,441,569, Cl. 177-211.000.
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, to Nippon Petrochemicals Company Ltd. Electrical insulating oil composition. 4,442,027, Cl. 252-574.000.
Sato, Eiji: *See*—
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Sato, Masami; Akashi, Goro; Okuzawa, Yasutoshi; and Okutu, Toshimitu, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,442,171, Cl. 428-336.000.
Sato, Shunji: *See*—
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Sawada, Yasuhiro; Inoue, Tadashi; and Nishida, Toyoaki, to Nippon Steel Corp.; and Mishima Kosan Co., Ltd. Apparatus for measuring a metal surface position. 4,442,389, Cl. 318-642.000.
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Sayles, David C., to United States of America, Army. Embedment system for ultrahigh-burning rate propellants of solid propulsion subsystems. 4,441,942, Cl. 149-19.600.
SCAL Societe de Conditionnements en Aluminium: *See*—
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Schaefer, Willi, to Siemens Aktiengesellschaft. X-Ray examination apparatus. 4,442,536, Cl. 378-26.000.
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Schafer, Paul: *See*—
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Schaffeler, Alois, to Marquardt GmbH. Electrical switch. 4,442,328, Cl. 200-76.000.
Scheer, Daniel J., to Pawnee Products,Inc. Roll out nest system and method. 4,441,456, Cl. 119-45.00R.
Schering Aktiengesellschaft: *See*—
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Schlig, Harold W.; and Staehs, Joel L., to BAE Automated Systems, Inc. Pusher mechanism. 4,441,604, Cl. 198-598.000.
Schlissel, Ann R. Telescopic shopping cart. 4,441,734, Cl. 280-638.000.
Schlumberger Technology Corporation: *See*—
Terral, Ben D., 4,441,519, Cl. 137-15.000.
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Schmitt, Kirk D., to Mobil Oil Corporation. Process of making propane sulfonates. 4,442,042, Cl. 260-512.00R.
Schneider, Bernard A. Identification technique for air traffic. 4,442,430, Cl. 343-6.50R.
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Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Fritz, Rolf; and Kissel, Karl-Friedrich, to Hochtemperatur-Reaktorbau GmbH. Supporting floor for the core of a nuclear reactor. 4,442,066, Cl. 376-302.000.
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Bentz, Rolf; and Schori, Christian, 4,441,896, Cl. 55-85.000.
Schott, Karl: *See*—
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Schroeder, Verdell H.: *See*—
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Schroeder, Warren C. Bicycle sail. 4,441,728, Cl. 280-213.000.
Schuette, Heinz G., to Witt, Horst. Steeple. 4,441,283, Cl. 52-57.000.
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Schumag GmbH: *See*—
Wetzels, Walter; Crott, Kurt; and Voell, Erich, 4,441,280, Cl. 51-103.00R.
Schuster, Ernst, to Carbon Gas Technologie GmbH. Process for the gasification of carboniferous material in solid, pulverulent or even lump form. 4,441,892, Cl. 48-197.00R.
Schutt, Dieter; Schwengler, Manfred; Ulland, Hartmut; and Weis, Helmut H., to International Business Machines Corporation. Device for storing and displaying graphic information. 4,442,503, Cl. 364-900.000.
Schwaab, Josef: *See*—
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Sciolla, Lussoria A. Apparatus for admixing a gas to a liquid, in particular for admixing oxygen to polluted water. 4,442,045, Cl. 261-36.00R.
SCM Corporation: *See*—
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Borovicka, David A., Sr.; Hahn, Kenneth G., Jr.; and Tupa, John T., 4,442,257, Cl. 524-555.000.
Brown, George L.; and Spencer, Arthur T., 4,442,246, Cl. 523-404.000.
Scott, Doug. Picture framing device. 4,441,268, Cl. 40-152.100.

Scott, Paul T.: *See*—
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Seabrook Blanching Corporation: *See*—
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Seale, Joseph B. Fluid energy conversion system. 4,441,872, Cl. 417-282.000.

Seaman, Gary G., to AT&T Technologies, Inc. Apparatus for severing an article from a carrier and for positioning the severed article. 4,441,391, Cl. 83-165.000.

Segal, William J., to Orion Industries, Inc. Decorative wheel covering for providing a multiplicity of designs. 4,441,762, Cl. 301-37.00R.

Segawa, Hirohisa: *See*—
Mizuno, Takaji; Suwahara, Hiroshi; and Segawa, Hirohisa, 4,442,339, Cl. 219-130.330.

Segawa, Kiyoshi, to Fukuda Denshi Kabushiki Kaisha. X-Ray transmissive electrode-shielded wire assembly and manufacture thereof. 4,442,315, Cl. 174-36.000.

Segawa, Takashi, to Shimano Industrial Company Limited. Gear crank for a bicycle. 4,441,383, Cl. 74-594.200.

Seiko Instruments & Electronics Ltd.: *See*—
Ishijima, Hiroshi; and Koga, Toshiyuki, 4,442,535, Cl. 378-50.000.
Shimbo, Masafumi, 4,442,448, Cl. 357-42.000.

Seirei Industry Company Limited: *See*—
Imamura, Ryuichi; Shimazaki, Kanzo; Yahashi, Satoru; Yamamoto, Takashi; and Yano, Noriyuki, 4,441,412, Cl. 99-601.000.

Seitz, Steven P.: *See*—
Nicolaou, Kyriacos C.; Petasis, Nicos A.; and Seitz, Steven P., 4,442,099, Cl. 424-248.570.

Seki, Michiharu: *See*—
Okamoto, Hiroshi; Seki, Michiharu; and Ohayashi, Hidehito, 4,441,981, Cl. 204-426.000.

Sekisui Plastic Co., Ltd.: *See*—
Kajimura, Mutsuhiko; and Maeda, Tetsuji, 4,442,232, Cl. 521-56.000.

Sekula, Paul J.; and Potts, Gerald R., to Firestone Tire & Rubber Company, The. Device and method for producing pneumatic tires having preselected noise characteristics. 4,442,499, Cl. 364-574.000.

Selleri, Narciso: *See*—
Golinelli, Guido; and Selleri, Narciso, 4,441,257, Cl. 33-174.00L.

Semenov, Mikhail K.: *See*—
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,441,549, Cl. 165-145.000.

Seng, Stephen: *See*—
Propster, Mark A.; Seng, Stephen; and Hohman, Charles M., 4,441,906, Cl. 65-27.000.

Seragnoli, Enzo, to G. D. Societa' per Azioni. Reels supplying device. 4,441,662, Cl. 242-58.000.

Sessions, Robert W.; Jeslis, Jerome; and Rodzen, Richard A., to Ferris Manufacturing Corp. EKG Electrode. 4,441,500, Cl. 128-641.000.

Setterberg, John R., Jr.; and Patel, Dhirajlal C., to Otis Engineering Corporation. Anchor for use in a well. 4,441,553, Cl. 166-138.000.

Seuria, Georges J. C., to Avions Marcel Dassault-Breguet Aviation. Process for purifying the active liquid within hydraulic control circuits. 4,442,008, Cl. 210-683.000.

Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., to SAB Industri AB. Rail vehicle slack adjuster. 4,441,591, Cl. 188-202.000.

Sevier, Peter E.: *See*—
Pryor, Michael J.; and Sevier, Peter E., 4,441,542, Cl. 164-485.000.

Sexton, Larry J. Shotshell component recovery apparatus and method. 4,441,400, Cl. 86-1.00A.

Seyffer, Siegfried, to Robert Bosch GmbH. Electrohydraulic pressure-regulating valve. 4,441,686, Cl. 251-127.000.

Shaddock, Clarence L., Jr.: *See*—
Foster, David I.; Scott, Paul T.; Pierick, Mark W.; and Shaddock, Clarence L., Jr., 4,442,077, Cl. 423-210.000.

Shalaby, Shalaby W.; and Koelmel, Donald F., to Ethicon, Inc. Copolymers of p-dioxanone and 2,5-morpholinediones and surgical devices formed therefrom having accelerated absorption characteristics. 4,441,496, Cl. 128-335.500.

Shallhorn, Paul M.: *See*—
Karnis, Alkibiadis; and Shallhorn, Paul M., 4,441,960, Cl. 162-49.000.

Shan-Rod, Inc.: *See*—
Uhl, Larry A., 4,441,726, Cl. 277-230.000.

Shapiro, Rafael, to Du Pont de Nemours, E. I., and Company. Thiophene or furan herbicides. 4,441,910, Cl. 71-90.000.

Sharma, Satish C., to General Tire & Rubber Company, The. Heat and humidity resistant steel cord reinforced rubber composite. 4,441,946, Cl. 156-307.300.

Sharp Kabushiki Kaisha: *See*—
Yasuda, Takatoshi, 4,442,344, Cl. 219-497.000.
Yoneda, Shigeo, 4,442,342, Cl. 219-216.000.

Shatterproof Glass Corporation: *See*—
McKelvey, Harold E.; Livingston, William T.; and Sheldon, Edward D., 4,441,909, Cl. 65-273.000.

Shaw, William C., to Imax Systems Corporation. Film support element assembly. 4,441,796, Cl. 352-184.000.

Shawyer, Peter J.: *See*—
Gabbitas, Denbigh M.; and Shawyer, Peter J., 4,441,302, Cl. 53-52.000.

Shedden, Joel T. Device for reducing wear in vehicle suspension systems. 4,441,736, Cl. 280-754.000.

Sheldon, Edward D.: *See*—
McKelvey, Harold E.; Livingston, William T.; and Sheldon, Edward D., 4,441,909, Cl. 65-273.000.

Shell Oil Company: *See*—
Clark, Michael T.; and Gilmore, Ian J., 4,441,911, Cl. 71-91.000.
Lewis, Robert M.; Ryan, Robert C.; and Slaugh, Lynn H., 4,442,307, Cl. 568-470.000.
Ten Haken, Pieter; and Webb, Shirley B., 4,441,912, Cl. 71-92.000.

Shepherd, Michael, to Wallace Murray Corporation. Modulated viscous fan drive. 4,441,598, Cl. 192-58.00B.

Sherman, Larry: *See*—
Kingsley, Richard T.; and Sherman, Larry, 4,441,612, Cl. 206-620.000.

Sherman, Rand C.; and Wood, Van E., to Stanley Electric Company, Ltd. On-line inspection method and system for bonds made to electronic components. 4,441,248, Cl. 29-574.000.

Sherwood Medical Company: *See*—
Kotsifas, Peter N.; Wetzel, Victor H.; and Gilson, Richard W., 4,441,509, Cl. 128-757.000.

Shibasaki, Kyuichi; and Kurashima, Hideo, to Toyo Seikan Kaisha, Ltd. Apparatus for detecting pinholes in cans. 4,441,813, Cl. 356-237.000.

Shibata, Masaaki: *See*—
Takahashi, Nobuyuki; Shibata, Masaaki; and Furuno, Yoshikuni, 4,441,936, Cl. 148-12.00C.

Shibayama, Kimio; Itaya, Kingo; and Fujimoto, Teruo, to Toyo Soda Manufacturing Co., Ltd. Pattern formation with negative type resist. 4,442,199, Cl. 430-323.000.

Shibazaki, Kenji; and Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Electrostatic copying apparatus including a switch checking system. 4,441,804, Cl. 355-14.00R.

Shibukawa, Nobuyuki: *See*—
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Hashimoto, Takashi; and Shibukawa, Nobuyuki, 4,442,087, Cl. 424-85.000.

Shields, Jerome D.: *See*—
Hedlund, Lee V.; and Shields, Jerome D., 4,442,465, Cl. 360-130.230.

Shiga, Atsushi: *See*—
Kawabata, Fumimaru; Shiga, Atsushi; and Yamaguchi, Tadamasa, 4,442,340, Cl. 219-137.0PS.

Shiga, Tetsuo; Kimura, Takeo; Ito, Yoshinobu; Akashi, Kageyasu; Akiyama, Minoru; and Matsui, Takeki, to Asahi Kasei Kogyo Kabushiki Kaisha. Post-activation type dry image forming material. 4,442,202, Cl. 430-600.000.

Shih, Stuart S.: *See*—
Heck, Roland H.; Rosinski, Edward J.; and Shih, Stuart S., 4,442,023, Cl. 502-222.000.

Shiley, Inc.: *See*—
Ionescu, Marian I.; Lenker, Jay A.; and Rosenbluth, Robert F., 4,441,216, Cl. 3-1.500.

Shima, Seiya: *See*—
Mitsui, Nobuo; Maeda, Yasuyuki; Kurihara, Tomiaki; Shima, Seiya; Hatakeyama, Takanobu; and Komuro, Katsu, 4,441,584, Cl. 187-29.00R.

Shimano Industrial Company Limited: *See*—
Segawa, Takashi, 4,441,383, Cl. 74-594.200.
Shimano, Keizo, 4,441,638, Cl. 224-35.000.

Shimano, Keizo, to Shimano Industrial Company Limited. Water bottle for a bicycle. 4,441,638, Cl. 224-35.000.

Shimazaki, Haruo: *See*—
Umezawa, Hidetsugu; Ogasawara, Takashi; and Shimazaki, Haruo, 4,441,531, Cl. 139-452.000.

Shimazaki, Kanzo: *See*—
Imamura, Ryuichi; Shimazaki, Kanzo; Yahashi, Satoru; Yamamoto, Takashi; and Yano, Noriyuki, 4,441,412, Cl. 99-601.000.

Shimbo, Masafumi, to Seiko Instruments & Electronics Ltd. Logic integrated circuit device. 4,442,448, Cl. 357-42.000.

Shimizu, Youichi: *See*—
Iwata, Yoshio; Fujita, Tsutomu; Horiuchi, Tsunehisa; and Shimizu, Youichi, 4,442,456, Cl. 358-213.000.

Shimogawa, Toshiaki: *See*—
Tsuge, Noboru; Shimogawa, Toshiaki; Kuwakado, Satosi; and Takei, Toshihiro, 4,441,738, Cl. 280-806.000.

Shintani, Atsunobu: *See*—
Hiraishi, Hisashi; Yamakami, Yoshiaki; and Shintani, Atsunobu, 4,441,926, Cl. 75-128.00A.

Shiokawa, Kozo: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; and Moriya, Koichi, 4,441,913, Cl. 71-94.000.

Shiozawa, Kazuo: *See*—
Watanabe, Koji; Higuchi, Yoshihiro; Yagi, Michio; and Shiozawa, Kazuo, 4,441,798, Cl. 354-483.000.

Shipp, Kenneth O., Jr.: *See*—
Hebert, Raymond A., Jr.; Levine, Lewis J.; and Shipp, Kenneth O., Jr., 4,441,829, Cl. 400-63.000.

Shirai, Hidemichi; Nakano, Kenji; and Moriwaki, Hisayoshi, to Sony Corporation. Signal recording and/or reproducing technique. 4,442,461, Cl. 358-343.000.

Shirasaki, Shinji; Tsuzuki, Yoshihiko; Hirabayashi, Yuzi; Okazaki, Hiroshi; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, to Nippondenso Company, Limited. Method and system for displaying vehicle operating parameters in a variable format. 4,442,424, Cl. 340-52.00F.

Shirley, Roger D.: *See*—
Lower, Ralph C.; and Shirley, Roger D., 4,441,330, Cl. 62-149.000.

Short, Edward H., III; Allen, Jerome D.; and Wood, Loren E., deceased (by Wood, Anna L., executrix), to BS&B Safety Systems, Inc. Scored reverse buckling rupture disk manufacturing method. 4,441,350, Cl. 72-55.000.

Shoup, Robert D.: *See*—
Flannery, James E.; Shoup, Robert D.; and Wexell, Dale R., 4,442,175, Cl. 428-404.000.
Malmendier, Joseph W.; Pride, Carol F.; Rhoads, Randy L.; Schlaufman, Robert J.; and Shoup, Robert D., 4,441,905, Cl. 65-21.300.

Shoup, Thomas E., to TRW Inc. Apparatus for conducting smut-free stud welding. 4,442,336, Cl. 219-98.000.

Shriners Hospitals for Crippled Children: *See*—
Poole, A. Robin; Mort, John S.; and Recklies, Anneliese D., 4,442,088, Cl. 424-85.000.

Shroff, Fali: *See*—
Johannes, Gerhard; Shroff, Fali; Dullis, Gerhard; and Steidl, Dieter, 4,442,244, Cl. 523-221.000.

Shu, Winston R., to Mobil Oil Corporation. Carbonated waterflooding for viscous oil recovery. 4,441,555, Cl. 166-272.000.

Shum, Lanson Y.: *See*—
Fromson, Robert E.; and Shum, Lanson Y., 4,442,494, Cl. 364-511.000.

Sidebottom, Donald L.: *See*—
Alley, Robert P.; Relyea, John W.; and Sidebottom, Donald L., 4,441,545, Cl. 165-26.000.

Siebens, Larry N.: *See*—
Daugherty, Carol A.; Siebens, Larry N.; and Daugherty, Ronald R., 4,441,487, Cl. 128-24.200.

Siegal, Burton L.: *See*—
Varon, David S.; and Siegal, Burton L., 4,441,300, Cl. 52-732.000.

Sieglen, Rolf A.: *See*—
Konig, Rainer; Freund, Hans-Ulrich; Heide, Helga; and Sieglen, Rolf A., 4,441,616, Cl. 209-44.100.

Sielaff GmbH & Co.: *See*—
Mehlan, Bernd; and Bayer, Josef, 4,441,628, Cl. 221-90.000.

Siemens Aktiengesellschaft: *See*—
Aichinger, Horst; and Franke, Kurt, 4,442,539, Cl. 378-207.000.
Baumann, Heinz; Kuhnel, Werner; and Rattner, Manfred, 4,442,483, Cl. 363-131.000.
Foertsch, Johann; and Meltsch, Hans-Juergen, 4,442,155, Cl. 428-99.000.
Fortsch, Johann; and Meltsch, Hans-Jurgen, 4,442,154, Cl. 428-99.000.
Gehring, Gerhard, 4,442,411, Cl. 330-296.000.
Gupta, Probodh D., 4,442,531, Cl. 375-94.000.
Haendle, Joerg; and Sklebitz, Hartmut, 4,442,534, Cl. 378-21.000.
Haendle, Joerg, 4,442,537, Cl. 378-99.000.
Haendle, Joerg, 4,442,538, Cl. 378-146.000.
Meltsch, Hans-Jurgen, 4,442,153, Cl. 428-99.000.
Schaefer, Willi, 4,442,536, Cl. 378-26.000.

Siemens-Allis, Inc.: *See*—
Pang, Peter N. C.; and Rozhansky, Boris, 4,442,472, Cl. 361-96.000.

Sika AG, vorm. Kaspar Winkler & Co.: *See*—
Burge, Theodor; and Bracher, Gustav, 4,442,021, Cl. 252-389.00R.

Silberring, Ludwig. Process for the separation of mixtures by means of mass transfer at different temperatures or pressures. 4,441,895, Cl. 55-70.000.

Siller, Bruno. Atmospheric oxygen element with positive electrode plates. 4,442,183, Cl. 429-29.000.

Silver, Sidney. Jack accessory support leg for trailer hitch. 4,441,693, Cl. 254-420.000.

Simard-Duquesne, Nicole: *See*—
Dvornik, Dushan M.; and Simard-Duquesne, Nicole, 4,442,118, Cl. 424-274.000.

Simmonds, Robin G., to Lilly Industries Limited. Isothiocyanato-azobenzene-sulfonic, arsonic and substituted-glutamic acid haptens. 4,442,032, Cl. 260-149.000.

Simmons, John A.: *See*—
Lowry, Gary H.; and Simmons, John A., 4,441,455, Cl. 119-14.470.

Simon, Johnathan G., to R. W. Simon Limited. Ventilation apparatus. 4,441,404, Cl. 98-96.000.

Simon, William E.; and Richards, Richard D., to Victoreen, Inc. Radiation energy measurement apparatus. 4,442,496, Cl. 364-524.000.

Simotamari, Akira: *See*—
Nakabayashi, Yasuyuki; Matsura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,441,260, Cl. 34-15.000.

Singer Company, The: *See*—
Weisz, William, 4,441,440, Cl. 112-158.00C.

Sitt, Rudiger: *See*—
Meyer, Horst; Sitt, Rudiger; Thomas, Gunter; Garthoff, Benward; Towart, Robertson; and Rosentreter, Ulrich, 4,442,100, Cl. 424-250.000.

Siwiak, Kazimierz; Garay, Oscar M.; and Balzano, Quirino, to Motorola, Inc. Helical antenna structure capable of resonating at two different frequencies. 4,442,438, Cl. 343-792.000.

Sklebitz, Hartmut: *See*—
Haendle, Joerg; and Sklebitz, Hartmut, 4,442,534, Cl. 378-21.000.

Skotheim, Terje, to United States of America, Energy. Photoelectrochemical cells for conversion of solar energy to electricity and methods of their manufacture. 4,442,185, Cl. 429-111.000.

Skrumsager, Birte K.: *See*—
Lassen, Joergen B.; Skrumsager, Birte K.; and Christensen, Joergen A., 4,442,113, Cl. 424-267.000.

Skrzypczak, Henry K.: *See*—
Peterson, Donald A.; and Skrzypczak, Henry K., 4,441,504, Cl. 128-686.000.

Skuster, James R., to Norwich Eaton Pharmaceuticals, Inc. Converting enzyme inhibitors. 4,442,038, Cl. 260-455.00R.

Skvaril, Joseph. Prefabricated cube construction system for housing and civic development. 4,441,286, Cl. 52-79.100.

Slaugh, Lynn H.: *See*—
Lewis, Robert M.; Ryan, Robert C.; and Slaugh, Lynn H., 4,442,307, Cl. 568-470.000.

Slepcevic, Dusan. Encapsulation mold with gate plate and method of using same. 4,442,056, Cl. 264-161.000.

Smith, David J.: *See*—
Melezoglu, Cevdet; and Smith, David J., 4,441,811, Cl. 356-128.000.

Smith, Edwin B.; and Craft, Richard A., to RCA Corporation. Phase locked-loop generator with closed-loop forcing function shaper. 4,442,412, Cl. 331-1.000.

Smith, Gerald L., to International Business Machines Corporation. Means for positioning optical components for a variable magnification/reduction copier optics system. 4,441,805, Cl. 355-14.00R.

Smith, James D. B.: *See*—
Bich, George J.; Burke, Thomas M.; and Smith, James D. B., 4,442,138, Cl. 427-116.000.

Smith, Jeffrey W.: *See*—
Wolf, Gary A.; Smith, Jeffrey W.; and Ihle, Nathan C., 4,442,028, Cl. 252-628.000.

Smith, John R., to United States of America, Air Force. Combined cycle ramjet engine. 4,441,312, Cl. 60-245.000.

Smith, Kent F.: *See*—
Knapp, William; Dunn, William; and Smith, Kent F., 4,442,508, Cl. 365-104.000.

Smith, Russell D.: *See*—
TenEyck, John D.; Smith, Russell D.; and Hoff, Kurt W., 4,442,219, Cl. 501-95.000.

Smith, William J.: *See*—
Michaels, Alan S.; Robertson, Channing R.; Cohen, Stanley N.; Inloes, Douglas S.; and Smith, William J., 4,442,206, Cl. 435-68.000.

Smith, Zan P.; and Haimbach, Frank, IV, to Osmonics, Inc. Biasing arrangement and filter unit for a filtering apparatus. 4,442,004, Cl. 210-448.000.

Smolin, William; and Estes, John H., to Texaco Inc. Adsorbent for separation of para-xylene. 4,442,222, Cl. 502-60.000.

Snaddon, Robert W. L., to General Electric Company. Method for coating with an atomizable material. 4,442,135, Cl. 427-31.000.

Snooks, Laura K., to Alex S. Reinharcz Enterprises, Inc. Steering wheel cover. 4,441,382, Cl. 74-558.000.

Snyder General Corporation: *See*—
Hoeffken, Russell W., 4,441,241, Cl. 29-157.30R.

Snyder, George H.; Snyder, George H., III; and Nusbaumer, Joseph M. Automatic fuel dispenser. 4,441,533, Cl. 141-59.000.

Snyder, George H., III: *See*—
Snyder, George H.; Snyder, George H., III; and Nusbaumer, Joseph M., 4,441,533, Cl. 141-59.000.

Snyder, Wesley L. Solar tracking apparatus for a gimbaled body. 4,442,348, Cl. 250-203.00R.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Wedral, Elaine R.; Hopefl, Richard M.; and Ivie, Rufus A., 4,442,104, Cl. 426-250.000.
Wissgott, Ulrich, 4,442,105, Cl. 426-250.000.

Societe MERCIER Freres: *See*—
Mercier, Georges; Mercier, Jacques; and Buisson, Pierre, 4,441,396, Cl. 83-871.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A." *See*—
Joubert, Raymond J. M.; and Bouiller, Jean G., 4,441,313, Cl. 60-262.000.

Societe Nationale Elf Aquitaine: *See*—
Baduel, Francois; Dumazy, Christian; and Sarrailh, Jean-Paul, 4,441,839, Cl. 405-202.000.

Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux-E.F.C.I.S.: *See*—
Bertails, Jean-Claude; and Perrin, Christian, 4,442,398, Cl. 323-315.000.

Sokoler, Henryk; and Evers, Poul H., to Everlite A/A. Panel, in particular for self-supporting roof structures and self-supporting roof structures assembled of such panels. 4,441,291, Cl. 52-309.100.

Sokolowski, Bronislaw. Drinking cover. 4,441,624, Cl. 220-254.000.

Sommariva, Gabriella, to MPS - Multi Packaging Services S.r.l. Multipack and method of making it. 4,441,611, Cl. 206-431.000.

Sommerfeld, Eugene G.; and Stamegna, Andrew P., to Du Pont de Nemours, E. I., and Company. Staged copolymerization of polyesters. 4,442,269, Cl. 525-440.000.

Sommerhalder, Rudolf, to Hawa AG. Component for airborne-sound insulation. 4,441,581, Cl. 181-286.000.

Sone, Masazumi: *See*—
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,441,479, Cl. 123-605.000.

Sonntag, Michael: *See*—
Fauss, Rudolf; Sonntag, Michael; Wagner, Kuno; Findeisen, Kurt; and Mennicken, Gerhard, 4,442,279, Cl. 528-44.000.

Sony Corporation: *See*—
Shirai, Hidemichi; Nakano, Kenji; and Moriwaki, Hisayoshi, 4,442,461, Cl. 358-343.000.

Soremа s.r.l.: *See—*
Gazzoni, Domenico, 4,441,262, Cl. 34-57.00D.
Sours, William A, to National Business Systems, Inc. Imprinting device and digit wheel assembly therefor. 4,441,419, Cl. 101-45.000.
Southern Illinois University Foundation: *See—*
Muchmore, Charles B.; Chen, Juh W.; and Tempelmeyer, Kenneth E., 4,441,886, Cl. 44-15.00R.
Spanur, Frank G., to Union Carbide Corporation. Dry path gas venting seal. 4,442,184, Cl. 429-54.000.
Spectra-Physics, Inc.: *See—*
Reeder, Dennis J.; Campbell, John S.; Kasunic, Keith J.; and Laiterman, Lee H., 4,442,524, Cl. 372-107.000.
Spencer, Arthur T.: *See—*
Brown, George L.; and Spencer, Arthur T., 4,442,246, Cl. 523-404.000.
Spencer, Joseph L.: *See—*
Pownall, Colin S.; and Spencer, Joseph L., 4,441,880, Cl. 432-13.000.
Spencer, Peter. Process and apparatus for thermal cracking and fractionation of hydrocarbons. 4,441,989, Cl. 208-76.000.
Speranza, George P.: *See—*
Zimmerman, Robert L.; and Speranza, George P., 4,442,238, Cl. 521-164.000.
Sperry Corporation: *See—*
de Jong, Joannes N. M.; and Earle, Richard L., 4,442,474, Cl. 361-283.000.
Eibner, Jules A., 4,442,425, Cl. 340-365.00S.
Lin, Ta-Tung, deceased; Lin, Meei H., Executrix; and Fedde, George A., 4,442,542, Cl. 382-8.000.
Rao, Basrur R., 4,442,362, Cl. 307-108.000.
Spitaler, Engelbert, to TMC Corporation. Adjusting mechanism for a ski binding jaw. 4,441,733, Cl. 280-633.000.
SRI International: *See—*
Sanjurjo, Angel, 4,442,082, Cl. 423-350.000.
Srinivasagopalan, Rangarajan: *See—*
Parrish, Henry H., Jr.; and Srinivasagopalan, Rangarajan, 4,442,530, Cl. 375-67.000.
Stacey, Robert E.: *See—*
Ronco, Kenneth J.; and Stacey, Robert E., 4,441,605, Cl. 198-731.000.
Stacy, Galen D.: *See—*
Likins, Merle R., Jr.; and Stacy, Galen D., 4,442,069, Cl. 422-62.000.
Stadler, Werner; and Petri, Bernd, to Standardwerk Eugen Reis GmbH. Device for counting coins. 4,441,516, Cl. 133-8.00A.
Staehs, Joel L.: *See—*
Schlig, Harold W.; and Staehs, Joel L., 4,441,604, Cl. 198-598.000.
Stahl- und Apparatebau Hans Leffer GmbH: *See—*
Blaschke, Kurt; and Roob, Josef, 4,441,749, Cl. 294-88.000.
Stahle, Helmut: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,442,120, Cl. 424-282.000.
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,442,121, Cl. 424-282.000.
Staisch, Diether, to WABCO Fahrzeugbremsen GmbH. Fluid pressure pump. 4,441,865, Cl. 417-319.000.
Stamegna, Andrew P.: *See—*
Sommerfeld, Eugene G.; and Stamegna, Andrew P., 4,442,269, Cl. 525-440.000.
Stamicarbon BV: *See—*
Dane, Lambertus M.; Engels, Johannes C. A.; and Stevens, Cornelis L., 4,442,054, Cl. 264-40.100.
Stanbel Ltd.: *See—*
Finkel, Henry, 4,441,642, Cl. 225-46.000.
Standard Oil Company: *See—*
Powers, Charles A.; and Holman, George B., 4,441,556, Cl. 166-290.000.
Standard Oil Company (Indiana): *See—*
Huie, Nicholas C.; and Bradley, William, 4,441,657, Cl. 241-14.000.
Richardson, Bryan D.; and Lewis, Shelton E., 4,441,955, Cl. 156-423.000.
Standardwerk Eugen Reis GmbH: *See—*
Stadler, Werner; and Petri, Bernd, 4,441,516, Cl. 133-8.00A.
Stanford University: *See—*
Michaels, Alan S.; Robertson, Channing R.; Cohen, Stanley N.; Inloes, Douglas S.; and Smith, William J., 4,442,206, Cl. 435-68.000.
Stanley Electric Company, Ltd.: *See—*
Sherman, Rand C.; and Wood, Van E., 4,441,248, Cl. 29-574.000.
Stansbury, Benjamin H. Automatically actuated enclosure light. 4,442,478, Cl. 362-191.000.
Stark, Forest G., to AVM Corporation. Cabinet drawer anti-tip lock device. 4,441,767, Cl. 312-216.000.
Starkweather, Robert G., to Escort Systems, Inc. Wrecker attachment. 4,441,851, Cl. 414-563.000.
Starline Products, Inc.: *See—*
West, Frank L.; and Norton, Larry A., 4,442,327, Cl. 200-51.00R.
Stauffer Chemical Company: *See—*
Baker, Don R.; and Gutman, Arnold D., 4,441,916, Cl. 71-100.000.
Canales, Manuel J.; and Reynolds, John, 4,442,083, Cl. 423-567.00R.
Duerksen, Charles J.; and Rodriquez, Benjamin P., 4,441,914, Cl. 71-95.000.
Schwartz, Robert D.; and Bodie, Elizabeth A., 4,442,128, Cl. 426-41.000.
Subramanian, N., 4,442,041, Cl. 260-502.50F.
Steag AG: *See—*
Bassier, Friedrich; and Goldschmidt, Klaus, 4,441,840, Cl. 405-267.000.
Steel Heddle Manufacturing Company: *See—*
Kramer, Charles F., 4,441,529, Cl. 139-207.000.
Steelcase Inc.: *See—*
Webster, Michael P., 4,441,580, Cl. 181-286.000.
Steenbergen, Johannes F., to Wavin B.V. Adhesively joined pipe connection. 4,441,743, Cl. 285-21.000.
Steenkamp, Gezinus A.: *See—*
Middel, Jan; and Steenkamp, Gezinus A., 4,441,935, Cl. 148-9.500.
Steffin, Morris. High speed single electrode membrane voltage clamp. 4,441,507, Cl. 128-734.000.
Stehman, Carl J., to Rockwell International Corporation. Transparent dialing between interconnected telecommunication switching systems. 4,442,321, Cl. 179-18.0EB.
Steidl, Dieter: *See—*
Johannes, Gerhard; Shroff, Fali; Dullis, Gerhard; and Steidl, Dieter, 4,442,244, Cl. 523-221.000.
Stein, David M.: *See—*
Fletcher, Robert P.; Stein, David M.; and Wladawsky-Berger, Irving, 4,442,487, Cl. 364-200.000.
Steinmair, Karl, to Voest-Alpine Aktiengesellschaft. Apparatus for storing strip, particularly metal strip. 4,441,661, Cl. 242-55.000.
Stenkvist, Sven-Einar: *See—*
Rappinger, Bo; and Stenkvist, Sven-Einar, 4,442,526, Cl. 373-95.000.
Stenzel, Gerhard: *See—*
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,442,170, Cl. 428-333.000.
Stephan, Rudolf: *See—*
Brandstetter, Franz; Hambrecht, Juergen; Stephan, Rudolf; Overhoff, Heinz-Juergen; Schwaab, Josef; Bernhard, Claus; Swoboda, Johann; and Echte, Adolf, 4,442,263, Cl. 525-83.000.
Sternberg, Stanley R.; and Lougheed, Robert M., to Environmental Research Institute. Bit enable circuitry for an image analyzer system. 4,442,543, Cl. 382-49.000.
Sternheim, Marek A.: *See—*
Alspector, Joshua; Kinsbron, Eliezer; and Sternheim, Marek A., 4,441,249, Cl. 29-577.00C.
Stevens, Cornelis L.: *See—*
Dane, Lambertus M.; Engels, Johannes C. A.; and Stevens, Cornelis L., 4,442,054, Cl. 264-40.100.
Stevens, Fred C. Controlled wheel braking system. 4,441,589, Cl. 188-181.00T.
Stewart, Daniel L.: *See—*
Dummermuth, Ernst H.; Galdun, Daniel J.; Grudowski, Raymond A.; and Stewart, Daniel L., 4,442,504, Cl. 364-900.000.
Stewart, Roger G.: *See—*
Ipri, Alfred C.; and Stewart, Roger G., 4,442,447, Cl. 357-41.000.
Stewart-Warner Corporation: *See—*
Ponczek, George M., 4,441,378, Cl. 74-414.000.
Stiemert, Ward L.: *See—*
Flinn, John W.; Johnson, James D.; and Stiemert, Ward L., 4,441,535, Cl. 144-3.00K.
Stierli, Robert F., to W. R. Grace & Co. Waterproofing laminate. 4,442,148, Cl. 428-40.000.
Stoelting Company: *See—*
Peterson, Donald A.; and Skrzypczak, Henry K., 4,441,504, Cl. 128-686.000.
Stoffel, James C.: *See—*
Moreland, John F.; and Stoffel, James C., 4,442,544, Cl. 382-53.000.
Stohlquist, Roger H., to Anderson Bros. Mfg. Co. Apparatus for feeding web material from a supply roll. 4,441,664, Cl. 242-75.420.
Stoides, John G.: *See—*
Finkel, Joel R.; Freudenthal, William E.; and Stoides, John G., 4,442,541, Cl. 382-7.000.
Stojanik, Bernd: *See—*
Lieser, Karl H.; and Stojanik, Bernd, 4,442,071, Cl. 423-10.000.
Stojek, Dieter, to Ford Motor Company. Camshaft bearing and method for mounting the camshaft. 4,441,243, Cl. 29-433.000.
Stoll, Kurt. Sequencing valve. 4,441,523, Cl. 137-624.180.
Stoody, William R. Soft shell aerosol dispenser unit. 4,441,632, Cl. 222-129.000.
Storage Technology Partners (through STC Computer Research Corporation): *See—*
Zasio, John; Cooke, Larry; and Paul, Raymond, 4,442,361, Cl. 250-491.100.
Storm, Gregory A.: *See—*
Storm, Nelson; and Storm, Gregory A., 4,441,279, Cl. 51-69.000.
Storm, Nelson; and Storm, Gregory A., to E-Z Products, Inc., by said Nelson Storm. Portable sharpener. 4,441,279, Cl. 51-69.000.
Storz, Werner, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Fluid clutch. 4,441,599, Cl. 192-58.00B.
Stover, William A.: *See—*
Chester, Arthur W.; and Stover, William A., 4,442,223, Cl. 502-68.000.
Stowe, Lawrence R., to Mobil Oil Corporation. Shale retorting with inorganic removal prior to combustion. 4,441,986, Cl. 208-11.00R.
Strain, Ernest D., Jr. Method and apparatus for aerating fish ponds. 4,441,452, Cl. 119-3.000.
Straka, Richard B.: *See—*
Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., 4,441,406, Cl. 99-275.000.

Strolle, Christopher H.: *See—*
Reitmeier, Glenn A.; and Strolle, Christopher H., 4,442,545, Cl. 382-56.000.
Structural Graphics, Inc.: *See—*
Crowell, Christopher S.; and Dennison, Warren, 4,441,270, Cl. 40-534.000.
Struthers Wells Corporation: *See—*
Chase, A. Timothy, 4,441,550, Cl. 165-145.000.
Studebaker, Irving G.: *See—*
Hutchins, Ned M.; Studebaker, Irving G.; Kvapil, Rudolf; and Ricketts, Thomas E., 4,441,759, Cl. 299-2.000.
Su, Fu-Chu. Rear view mirror locking mechanism. 4,441,682, Cl. 248-475.00R.
Subramanian, N., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,442,041, Cl. 260-502.50F.
Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Storz, Werner, 4,441,599, Cl. 192-58.00B.
Sudo, Denpei: *See—*
Matukura, Yoshiharu; and Sudo, Denpei, 4,441,621, Cl. 215-247.000.
Suenaga, Junichi: *See—*
Sumi, Masao; Suenaga, Junichi; Takenaka, Masazo; Murano, Itaru; Tanabe, Mikio; and Hirai, Kiyoshi, 4,442,252, Cl. 524-183.000.
Sugimoto, Sakae: *See—*
Saito, Yoshinobu; and Sugimoto, Sakae, 4,442,067, Cl. 420-428.000.
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, to Kubota Ltd. Heat resistant cast iron-nickel-chromium alloy. 4,442,068, Cl. 420-584.000.
Sugitawa, Chikara: *See—*
Yusa, Haruhiko; Hoshino, Mitsuru; Kurosaki, Akira; Furusawa, Hironobu; and Sugitawa, Chikara, 4,442,262, Cl. 525-69.000.
Suh, Byoung I., to Bisco, Inc. Dental filling materials. 4,442,240, Cl. 523-116.000.
Suhara, Shigeo: *See—*
Abe, Toshio; Ishikawa, Hiroshi; and Suhara, Shigeo, 4,441,324, Cl. 60-753.000.
Sukonick, Josef, to Cadtrak Corporation. Real time toroidal pan. 4,442,495, Cl. 364-521.000.
Sullivan, Michael C. W.: *See—*
Thorby, Douglas C.; and Sullivan, Michael C. W., 4,441,671, Cl. 244-63.000.
Sulzbach, Hans-Michael: *See—*
Proksa, Ferdinand; Sulzbach, Hans-Michael; and Raffel, Reiner, 4,442,070, Cl. 422-133.000.
Sulzer Brothers Limited: *See—*
Julich, Werner, 4,441,528, Cl. 139-66.00R.
Sumi, Masao; Suenaga, Junichi; Takenaka, Masazo; Murano, Itaru; Tanabe, Mikio; and Hirai, Kiyoshi, to Unitika Ltd.; and Okayama Paper Mill Co., Ltd. Cold-set adhesive compositions comprising polyvinyl alcohol for paper and paper board. 4,442,252, Cl. 524-183.000.
Sumitomo Bakelite Company Limited: *See—*
Saito, Takahide; and Nakagawa, Yasuo, 4,441,875, Cl. 425-3.000.
Sumitomo Chemical Company, Limited: *See—*
Aratani, Yutaka, 4,442,254, Cl. 524-413.000.
Kataoka, Yushin; Matsuda, Masaaki; and Kamoda, Masaru, 4,442,231, Cl. 521-32.000.
Sumitomo Electric Industries, Ltd.: *See—*
Fukuda, Akira, 4,442,528, Cl. 375-20.000.
Hara, Akio; and Yazu, Shuji, 4,442,180, Cl. 428-551.000.
Mori, Yoshikatsu, 4,441,841, Cl. 407-114.000.
Sun-Dor-Co.: *See—*
Grabendike, James F.; and Grabendike, Donald E., 4,441,296, Cl. 52-456.000.
Sun-Flex Company, Inc.: *See—*
Jandrell, Louis H. M., 4,442,317, Cl. 178-18.000.
Sun Tech, Inc.: *See—*
Hsu, Chao-Yang; and Lyons, James E., 4,442,036, Cl. 260-396.00R.
Sunakawa, Makoto; Moroishi, Yutaka; and Mune, Isao, to Nitto Electric Industrial Co., Ltd. Water-soluble pressure-sensitive adhesive composition. 4,442,258, Cl. 524-767.000.
Sundstrand Corporation: *See—*
Hucker, David J., 4,442,396, Cl. 322-21.000.
Sundstrand Data Control, Inc.: *See—*
Hanson, Richard A., 4,441,366, Cl. 73-517.00B.
Supik, Helmuth, to Continental Group, Inc., The. Apparatus for annealing of end rim. 4,441,699, Cl. 266-255.000.
Suwahara, Hiroshi: *See—*
Mizuno, Takaji; Suwahara, Hiroshi; and Segawa, Hirohisa, 4,442,339, Cl. 219-130.330.
Suyama, Tadakazu: *See—*
Arakawa, Yoshio; Takanabe, Atsuyuki; Uemura, Yahiro; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,442,037, Cl. 260-397.200.
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; Fukino Tadashi; and Yoshida, Minoru, to Hitachi Medical Corporation. Radiation detector. 4,442,360, Cl. 250-486.100.
Suzuki, Hirohisa; and Takahashi, Hironiro, to Ajinomoto Co., Inc. Process for producing corn oil. 4,442,034, Cl. 260-236.600.
Suzuki, Kunihiko, to Nissan Motor Company, Limited. Four-wheel vehicle drive system. 4,441,575, Cl. 180-248.000.
Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Timer switch for vehicle. 4,442,363, Cl. 307-141.400.
Suzuki, Nobuyoshi, to Olympus Optical Co. Ltd. Device for diluting liquid sample. 4,441,374, Cl. 73-864.120.
Suzuki, Tadashi, to Alps Electric Co., Ltd. Elastomeric member for suspending a motor while positioning its magnet. 4,442,367, Cl. 310-91.000.
Suzuki, Yasuhiko: *See—*
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,442,375, Cl. 313-142.000.
Svensson, Leif Å: *See—*
Olsson, O. A. Torsten; Svensson, Leif Å; and Wetterlin, Kjell I. L., 4,442,300, Cl. 560-66.000.
Swallow, Brian R., to Union Carbide Corporation. Method of treating carbon-dioxide-containing natural gas. 4,441,900, Cl. 62-29.000.
Swanson, Rollan. Integrated process using non-stoichiometric sulfides or oxides of potassium for making less active metals and hydrocarbons. 4,441,923, Cl. 75-28.000.
Swasey, Chester C.: *See—*
Blumberg, Morris; and Swasey, Chester C., 4,442,017, Cl. 252-301.210.
Swedlow, Inc.: *See—*
White, William H.; Harbison, William C.; and Nelson, Gary L., 4,442,168, Cl. 428-331.000.
Swift, Allan W., to E. J. Brooks Company. Security seal with weakened portion in stud. 4,441,233, Cl. 24-16.0PB.
Swiss Aluminium Ltd.: *See—*
Wagner, Alfred; Ames, Adolf; and Hodel, Ulf, 4,441,646, Cl. 228-116.000.
Swoboda, Johann: *See—*
Brandstetter, Franz; Hambrecht, Juergen; Stephan, Rudolf; Overhoff, Heinz-Juergen; Schwaab, Josef; Bernhard, Claus; Swoboda, Johann; and Echte, Adolf, 4,442,263, Cl. 525-83.000.
Symons, James D., to General Motors Corporation. Method of making a cast iron sealing ring. 4,441,349, Cl. 72-53.000.
Symons, Robert S., to Varian Associates, Inc. Uniform field solenoid magnet with openings. 4,442,417, Cl. 335-210.000.
Syntex (U.S.A.) Inc.: *See—*
Jones, Gordon H.; and Young, John M., 4,442,127, Cl. 424-331.000.
Synthelabo: *See—*
Beeley, Nigel R. A.; Cremer, Gerard; Dimsdale, Michael J.; and Manoury, Philippe, 4,442,126, Cl. 424-324.000.
Szarka, David D.: *See—*
Harris, Allen E.; and Szarka, David D., 4,441,721, Cl. 277-26.000.
Szkaradek, Edward J., to Morehouse Industries, Inc. Sandmill screen mounting assembly. 4,441,658, Cl. 241-46.170.
TA Mfg., Inc.: *See—*
Byerly, Robert M., 4,441,677, Cl. 248-74.00B.
Taft, Charles K.; and Herrick, Benjamin M. Analog electro-fluidic signal transducer. 4,441,526, Cl. 137-831.000.
Taga, Yutaka; Watanabe, Kazuaki; and Nakamura, Shinya, to Toyota Jidosha Kabushiki Kaisha. Transmission control system with positive lockup clutch disengaging system. 4,441,385, Cl. 74-867.000.
Takada, Syun; Kadowaki, Takashi; Okumura, Mitsuhiro; Nakamura, Shinichi; and Iwagaki, Masaru, to Konishiroku Photo Industry Co., Ltd. Method for production of a silver halide photographic light-sensitive material. 4,442,201, Cl. 430-569.000.
Takagi, Shigeru; and Tomita, Masahiro, to Nippon Soken, Inc. Dust collecting filter. 4,441,899, Cl. 55-485.000.
Takagi, Shunichi: *See—*
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,442,375, Cl. 313-142.000.
Takagi, Yasuo: *See—*
Yoneda, Kenji; Sanezawa, Fumio; Takagi, Yasuo; and Ushijima, Yuji, 4,441,468, Cl. 123-198.00E.
Takagishi, Haruyoshi; Kamio, Kazuyoshi; and Fujikawa, Tsuneo, to Nissan Motor Company, Limited. Automatic vehicle-body assembling system. 4,441,645, Cl. 228-47.000.
Takahashi, Hironiro: *See—*
Suzuki, Hirohisa; and Takahashi, Hironiro, 4,442,034, Cl. 260-236.600.
Takahashi, Kihei, to Yoshida Kogyo K.K. Apparatus for manufacturing a continuous slide fastener stringer chain with element-free space portions. 4,441,438, Cl. 112-104.000.
Takahashi, Makoto: *See—*
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,442,068, Cl. 420-584.000.
Takahashi, Naoya: *See—*
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, 4,442,027, Cl. 252-574.000.
Takahashi, Nobuyuki; Shibata, Masaaki; and Furuno, Yoshikuni, to Nippon Steel Corporation. High-strength, low-yield-point, cold-rolled steel sheet or strip suitable for deep drawing. 4,441,936, Cl. 148-12.00C.
Takahashi, Takeshi: *See—*
Oshita, Youichi; Sato, Shunji; Takahashi, Takeshi; and Hirasawa, Kunio, 4,442,330, Cl. 200-148.00A.
Takahashi, Toshiaki: *See—*
Momose, Haruhiko; Takahashi, Toshiaki; and Hoshino, Yasushi, 4,441,810, Cl. 356-1.000.
Takanabe, Atsuyuki: *See—*
Arakawa, Yoshio; Takanabe, Atsuyuki; Uemura, Yahiro; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,442,037, Cl. 260-397.200.
Takano, Shouji, to Tokyo Shibaura Denki Kabushiki Kaisha. Control device of copying machine. 4,442,505, Cl. 364-900.000.
Takara Kogyo Co., Ltd.: *See—*
Ueda, Yoshihiko, 4,441,998, Cl. 210-275.000.
Takashima, Susumu: *See—*
Tamura, Nobuaki; and Takashima, Susumu, 4,442,355, Cl. 250-310.000.

Takeda Chemical Industries, Ltd.: *See*—
Matukura, Yoshiharu; and Sudo, Denpei, 4,441,621, Cl. 215-247.000.

Takegami, Shinsuke; Ban, Kaoru; and Wakitani, Mitsuru, to Japan Exlan Company, Limited. Novel water-absorbing acrylic fibers. 4,442,173, Cl. 428-372.000.

Takei, Toshihiro: *See*—
Tsuge, Noboru; Shimogawa, Toshiaki; Kuwakado, Satosi; and Takei, Toshihiro, 4,441,738, Cl. 280-806.000.

Takemura, Takehide, to Matsushita Electric Industrial Co., Ltd. Encoder output pulse detection using two stage shift register and clock oscillator. 4,442,532, Cl. 377-3.000.

Takenaka Komuten Co., Ltd.: *See*—
Ikuo, Yamaguchi; Yasuo, Higashibata; and Masaru, Fujimura, 4,441,289, Cl. 52-167.000.

Takenaka, Masazo: *See*—
Sumi, Masao; Suenaga, Junichi; Takenaka, Masazo; Murano, Itaru; Tanabe, Mikio; and Hirai, Kiyoshi, 4,442,252, Cl. 524-183.000.

Takenoya, Hideaki: *See*—
Hanyu, Susumu; and Takenoya, Hideaki, 4,441,439, Cl. 112-158.00E.

Takeuchi, Bunzi: *See*—
Kimura, Minoru; and Takeuchi, Bunzi, 4,442,178, Cl. 428-446.000.

Takeuchi, Hideo; Horiguchi, Satoru; and Tamaki, Ryuzo, to Dai Nippon Insatsu Kabushiki Kaisha. Calibration method for printing plate picture pattern area meter. 4,441,819, Cl. 356-380.000.

Takeuchi, Seiji, to Don Fell Limited; and Lawrence Fell Limited. Bag system for transportation of bulk liquids. 4,441,627, Cl. 220-461.000.

Takeuchi, Yasuhisa, to Nissan Motor Company, Limited. Solar radiation heat influx sensor for an automotive vehicle. 4,441,405, Cl. 98-201.000.

Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, to Toyo Stauffer Chemical Co., Ltd. Catalytic component for polymerization of α-olefin and method for homo- or co-polymerization of α-olefin. 4,442,224, Cl. 502-112.000.

Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, to Toyo Stauffer Chemical Co., Ltd. Catalytic component for polymerization of α-olefin and method for homo- or co-polymerization of α-olefin. 4,442,225, Cl. 502-112.000.

Takuo, Hosaka, to Nippon Crucible Co., Ltd. Spray method of applying of monolithic refractory material. 4,442,050, Cl. 264-30.000.

Taleff, Alexander: *See*—
Hicken, Michael G.; Kirschensteiner, Fred; True, Duane A.; and Taleff, Alexander, 4,441,242, Cl. 29-419.00R.

Tamagawa, Tohoru: *See*—
Yanabu, Satoru; Tamagawa, Tohoru; and Funahashi, Takumi, 4,442,469, Cl. 361-4.000.

Tamaki, Ryuzo: *See*—
Takeuchi, Hideo; Horiguchi, Satoru; and Tamaki, Ryuzo, 4,441,819, Cl. 356-380.000.

Tamamura, Sadao: *See*—
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Hashimoto, Takashi; and Shibukawa, Nobuyuki, 4,442,087, Cl. 424-85.000.

Tammer, Thomas: *See*—
Handte, Reinhard; Sander, Jurgen; and Tammer, Thomas, 4,442,294, Cl. 548-221.000.

Tamura, Nobuaki; and Takashima, Susumu, to Jeol, Ltd. Device for detecting secondary electrons in a scanning electron microscope. 4,442,355, Cl. 250-310.000.

Tanabe, Mikio: *See*—
Sumi, Masao; Suenaga, Junichi; Takenaka, Masazo; Murano, Itaru; Tanabe, Mikio; and Hirai, Kiyoshi, 4,442,252, Cl. 524-183.000.

Tanahashi, Toshio: *See*—
Toyoda, Shuhei; and Tanahashi, Toshio, 4,441,464, Cl. 123-52.0MB.

Tanaka, Mitsuo: *See*—
Okamoto, Kouichi; Sakuyama, Masaki; and Tanaka, Mitsuo, 4,442,369, Cl. 310-214.000.

Tanaka, Terukazu: *See*—
Ichihashi, Hitoshi; Tanaka, Terukazu; and Imasato, Yu, 4,442,101, Cl. 424-250.000.

Tangorra, Giorgio, to Industrie Pirelli S.p.A. Energy accumulator and internal-combustion engine starter comprising said accumulator. 4,441,466, Cl. 123-179.00S.

Tanigawa, Masumi: *See*—
Matsumura, Sowjun; Araki, Ken; Otaka, Tetsuo; and Tanigawa, Masumi, 4,441,965, Cl. 204-16.000.

Tascarella, Peter J. Automatic bed maker. 4,441,222, Cl. 5-488.000.

Tate & Lyle Public Limited Company: *See*—
Rathbone, Elner B.; Waites, Geoffrey M. H.; and Ford, William C. L., 4,442,123, Cl. 424-308.000.

Tateoka, Masamichi, to Canon Kabushiki Kaisha. Telecentric projection lenses. 4,441,792, Cl. 350-415.000.

Tatsutani, Toshio: *See*—
Uchida, Ryohei; Yamasaki, Tatsuo; Idei, Toshio; Tatsutani, Toshio; and Hagiwara, Ippei, 4,442,386, Cl. 318-254.000.

Tayler, Colin A. M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Compressors. 4,441,855, Cl. 415-53.00T.

Taylor, James L. Lock assembly with interchangeable noses for safe deposit boxes. 4,441,347, Cl. 70-370.000.

Taylor, Laurence D., to American Sterilizer Company. Fluid-tight seal. 4,441,724, Cl. 277-166.000.

Taylor, Ronald P.; Dewhurst, John E.; and Abouzahr, Saad M., to Mobay Chemical Corporation. Process and composition for the production of polyurethane elastomer moldings. 4,442,235, Cl. 521-122.000.

Tektronix, Inc.: *See*—
Barter, Archie M., 4,442,458, Cl. 358-243.000.
O'Dell, Gary B., 4,442,442, Cl. 346-136.000.

Teledyne Penn-Union: *See*—
Chart, John E., 4,442,182, Cl. 428-654.000.

Telmec Co., Ltd.: *See*—
Imahashi, Issei, 4,441,250, Cl. 29-578.000.

Tempelmeyer, Kenneth E.: *See*—
Muchmore, Charles B.; Chen, Juh W.; and Tempelmeyer, Kenneth E., 4,441,886, Cl. 44-15.00R.

TenEyck, John D.; Smith, Russell D.; and Hoff, Kurt W., to Kennecott Corporation. Two part castable ceramic cement. 4,442,219, Cl. 501-95.000.

Ten Haken, Pieter; and Webb, Shirley B., to Shell Oil Company. N-Pyrazinyl-N-benzylcarbamates, having fungicidal and plant growth regulating properties. 4,441,912, Cl. 71-92.000.

Teraoka, Masao, to Tochigi-Fuji Sangyo Kabushiki Kaisha. Automatic hub clutch. 4,441,597, Cl. 192-35.000.

Terral, Ben D., to Schlumberger Technology Corporation. Gas lift valve and method of presetting. 4,441,519, Cl. 137-15.000.

Teucci, Giampaolo. Forced-circulation evaporator plant. 4,441,958, Cl. 159-2.0MS.

Texaco Inc.: *See*—
Crone, John M., Jr., 4,442,024, Cl. 502-334.000.
McCoy, David R.; Gipson, Robert M.; and Naylor, Carter G., 4,442,043, Cl. 260-513.00R.
Smolin, William; and Estes, John H., 4,442,222, Cl. 502-60.000.
Zimmerman, Robert L.; and McDaniel, Kenneth G., 4,442,237, Cl. 521-131.000.
Zimmerman, Robert L.; and Speranza, George P., 4,442,238, Cl. 521-164.000.

Texas Instruments Incorporated: *See*—
Hornbeck, Larry J., 4,441,791, Cl. 350-360.000.
Johnson, Milo R., 4,442,136, Cl. 427-53.100.
Redwine, Donald J., 4,441,246, Cl. 29-571.000.
Wiggins, Richard H.; Doddington, George; and Cato, Craig J., 4,441,399, Cl. 84-470.00R.

Texcontor-Anstalt: *See*—
Niklaus, Zemp J., 4,442,124, Cl. 424-311.000.

Thaler, Warren A.; Walker, Thad O.; Lundberg, Robert D.; and Wagensommer, Joseph, to Exxon Research and Engineering Co. Drilling mud viscosification agents based on sulfonated ionomers. 4,442,011, Cl. 252-8.50M.

Thaler, Warren A.: *See*—
Lundberg, Robert D.; Thaler, Warren A.; and Agarwal, Pawan K., 4,442,253, Cl. 524-211.000.

Thatchcode Limited: *See*—
Clarkson, Joseph, 4,441,768, Cl. 312-257.0SM.

Theckston, Alexander. Method and apparatus for obtaining work from heat energy. 4,441,318, Cl. 60-527.000.

Thermo King Corporation: *See*—
Mayer, Donald K., 4,441,333, Cl. 62-239.000.

Thiele, Geraldine H., to Oxford Hill, Ltd. Process for detaching or preventing attachment of microorganisms to a surface. 4,442,125, Cl. 424-318.000.

Thirlwall, Alan C.: *See*—
Ive, John G. S.; and Thirlwall, Alan C., 4,442,520, Cl. 371-55.000.

Thomas G. Faria Corp.: *See*—
Montie, Douglas L., 4,441,364, Cl. 73-313.000.

Thomas, Gunter: *See*—
Meyer, Horst; Sitt, Rudiger; Thomas, Gunter; Garthoff, Benward; Towart, Robertson; and Rosentreter, Ulrich, 4,442,100, Cl. 424-250.000.

Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Lens disinfecting unit. 4,441,769, Cl. 312-270.000.

Thompson, Arthur M. Automobile roof mounting bracket and cartridge holder assembly. 4,441,641, Cl. 224-311.000.

Thompson, Earl R.: *See*—
Lemkey, Franklin D.; and Thompson, Earl R., 4,441,939, Cl. 148-31.000.

Thompson, Noel A. Coconut grater. 4,441,410, Cl. 99-538.000.

Thomson-CSF: *See*—
Huignard, Jean P.; and Malard, Marcel, 4,442,455, Cl. 358-209.000.

Thorby, Douglas C.; and Sullivan, Michael C. W., to British Aerospace Public Limited Company. Take-off ramps for aircraft. 4,441,671, Cl. 244-63.000.

Thorley, Graham R., to Transporation Design Technology, Inc. Auxiliary step for wheelchair lift. 4,441,850, Cl. 414-545.000.

Thornhill Craver Company: *See*—
Bailey, Kent T., 4,441,725, Cl. 277-167.500.

Thornton, Henry M.; and Thornton, John S., to Ashcombe Products Company. Gang cutting tool assembly. 4,441,245, Cl. 29-564.000.

Thornton, John S.: *See*—
Thornton, Henry M.; and Thornton, John S., 4,441,245, Cl. 29-564.000.

Thrush Incorporated: *See*—
Roberts, Peter, 4,441,579, Cl. 181-243.000.

Thual, Jacques G. L., to Hunter Douglas International N.V. Rooi Catootje. Suspended ceiling. 4,441,282, Cl. 52-39.000.

Thuermer, Joerg H. W., to Minnesota Mining and Manufacturing Company. Crimp connector for electrical wires. 4,442,316, Cl. 174-84.00C.

Thyssen Industrie Aktiengesellschaft: *See*—
Hantel, Alwin, 4,441,754, Cl. 296-51.000.

Tibbetts, George C.: *See*—
Blanchard, Senior N.; Flint, William T.; Tibbetts, George C.; and Sawyer, Joseph A., 4,442,324, Cl. 179-111.00E.
Tibbetts Industries, Inc.: *See*—
Blanchard, Senior N.; Flint, William T.; Tibbetts, George C.; and Sawyer, Joseph A., 4,442,324, Cl. 179-111.00E.
Tichenor, Daniel A.: *See*—
Hencken, Kenneth R.; Tichenor, Daniel A.; and Wang, James C. F., 4,441,816, Cl. 356-335.000.
Tiffany Industries, Inc.: *See*—
Carlton, Charles D., 4,441,432, Cl. 108-5.000.
Ting, Sei P.: *See*—
Haaf, William R.; Lee, Gim F., Jr.; and Ting, Sei P., 4,442,251, Cl. 524-141.000.
Tippetts, Thomas B.; and Manion, Francis M., to Garrett Corporation, The; and United States Government. Fluidic stabilization control. 4,441,525, Cl. 137-814.000.
Tipple, Neil A.; Gibson, Jerome W.; and Boyd, Ronald J., to DBS, Inc. Apparatus for embossing plates of different sizes and shapes. 4,441,831, Cl. 400-134.300.
Tipton, William E., Jr.: *See*—
Peterson, Donny L.; and Butts, Michael L., 4,441,697, Cl. 266-170.000.
Titus, Stephen C. Spherical puzzle. 4,441,715, Cl. 273-153.00S.
TMC Corporation: *See*—
Spitaler, Engelbert, 4,441,733, Cl. 280-633.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Fujii, Shigeo; Ikeda, Tokuzo; Mikami, Takashi; and Okano, Shuji, 4,442,062, Cl. 264-518.000.
Toba, Hirotaka; Itoh, Masanori; Nakano, Keita; Wakoh, Shoji; Toyoshima, Toshihiko; and Todo, Hidemasa, to Daicel Chemical Industries, Ltd.; and Fuji Xerox Co., Ltd. Electrostatic recording medium having an electrically conductive layer containing pre-dispersed electrically conductive carbon black and polyurethane binder resin. 4,442,160, Cl. 428-215.000.
Tobey, William H., to Martin Marietta Corporation. Motor driven hinge assembly. 4,441,376, Cl. 74-89.150.
Tochigi-Fuji Sangyo Kabushiki Kaisha: *See*—
Teraoka, Masao, 4,441,597, Cl. 192-35.000.
Todo, Hidemasa: *See*—
Toba, Hirotaka; Itoh, Masanori; Nakano, Keita; Wakoh, Shoji; Toyoshima, Toshihiko; and Todo, Hidemasa, 4,442,160, Cl. 428-215.000.
Tohoku Tokushuko Kabushiki Kaisha: *See*—
Saito, Yoshinobu; and Sugimoto, Sakae, 4,442,067, Cl. 420-428.000.
Tojo, Kenji: *See*—
Ikegawa, Masato; Sato, Eiji; and Tojo, Kenji, 4,441,870, Cl. 418-55.000.
Tokico Ltd.: *See*—
Saito, Kazuo, 4,441,588, Cl. 188-73.380.
Toko Kabushiki Kaisha: *See*—
Ishikawa, Hiroichi; and Mikami, Toshio, 4,442,397, Cl. 323-275.000.
Tokuda Seisakusho, Ltd.: *See*—
Nishikawa, Reiji; Satoyama, Shozo; Ito, Yoshinori; and Jyo, Hidetaka, 4,441,974, Cl. 204-192.00R.
Tokyo Electric Co., Ltd.: *See*—
Ochiai, Kuniaki; Horii, Masami; and Aoki, Osamu, 4,441,828, Cl. 400-124.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hayashida, Shizuo; and Masuko, Akinori, 4,442,413, Cl. 331-1.00A.
Ito, Takeshi, 4,442,464, Cl. 360-72.100.
Kimura, Minoru; and Takeuchi, Bunzi, 4,442,178, Cl. 428-446.000.
Kiryu, Rikio; and Bessho, Takeshi, 4,442,435, Cl. 343-709.000.
Nagano, Katsumi, 4,442,399, Cl. 323-315.000.
Nagano, Katsumi, 4,442,400, Cl. 323-315.000.
Nishikawa, Reiji; Satoyama, Shozo; Ito, Yoshinori; and Jyo, Hidetaka, 4,441,974, Cl. 204-192.00R.
Nozawa, Hiroshi, 4,441,941, Cl. 148-187.000.
Takano, Shouji, 4,442,505, Cl. 364-900.000.
Tsujimura, Kazunari; and Hadano, Yoshikazu, 4,441,856, Cl. 415-155.000.
Tsutsumi, Teruo, 4,441,416, Cl. 100-171.000.
Yamazaki, Takashi, 4,442,338, Cl. 219-121.0PE.
Yanabu, Satoru; Tamagawa, Tohoru; and Funahashi, Takumi, 4,442,469, Cl. 361-4.000.
Tolliver, Wilbur E. Concrete pipe reinforcement spacer bar. 4,441,527, Cl. 138-175.000.
Tomita, Masahiro: *See*—
Takagi, Shigeru; and Tomita, Masahiro, 4,441,899, Cl. 55-485.000.
Tomita, Osamu: *See*—
Narita, Masahisa; and Tomita, Osamu, 4,441,832, Cl. 400-144.200.
Tomiyasu, Shizuo: *See*—
Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, 4,442,224, Cl. 502-112.000.
Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, 4,442,225, Cl. 502-112.000.
Tooru, Tamura: *See*—
Matsuda, Shunsuke; Ito, Akio; Katsuaki, Mitani; Yoshinobu, Murakami; and Tooru, Tamura, 4,442,061, Cl. 264-328.700.
Tou, Jacob S.; and Schleppnik, Alfred A., to Monsanto Company. Chemical synthesis of ethylene/maleic anhydride dimer with phenylethyl end group. 4,442,298, Cl. 549-252.000.
Towart, Robertson: *See*—
Meyer, Horst; Sitt, Rudiger; Thomas, Gunter; Garthoff, Benward; Towart, Robertson; and Rosentreter, Ulrich, 4,442,100, Cl. 424-250.000.
Tower, Elizabeth S.: *See*—
Tower, Ronald H.; and Tower, Elizabeth S., 4,441,666, Cl. 242-134.000.
Tower, Ronald H.; and Tower, Elizabeth S. Sewing machine adapter. 4,441,666, Cl. 242-134.000.
Towmotor Corporation: *See*—
Macnab, John E., 4,441,585, Cl. 187-95.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Yusa, Haruhiko; Hoshino, Mitsuru; Kurosaki, Akira; Furusawa, Hironobu; and Sugitawa, Chikara, 4,442,262, Cl. 525-69.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Shibasaki, Kyuichi; and Kurashima, Hideo, 4,441,813, Cl. 356-237.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Shibayama, Kimio; Itaya, Kingo; and Fujimoto, Teruo, 4,442,199, Cl. 430-323.000.
Toyo Stauffer Chemical Co., Ltd.: *See*—
Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, 4,442,224, Cl. 502-112.000.
Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, 4,442,225, Cl. 502-112.000.
Toyoda Gosei Kabushiki Kaisha: *See*—
Iwasa, Tadanobu; and Ushida, Mituo, 4,442,167, Cl. 428-323.000.
Toyoda, Shuhei; and Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake system of a multi-cylinder internal combustion engine. 4,441,464, Cl. 123-52.0MB.
Toyoshima, Toshihiko: *See*—
Toba, Hirotaka; Itoh, Masanori; Nakano, Keita; Wakoh, Shoji; Toyoshima, Toshihiko; and Todo, Hidemasa, 4,442,160, Cl. 428-215.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kawaguchi, Hiroshi; and Nishina, Shuho, 4,441,380, Cl. 74-512.000.
Taga, Yutaka; Watanabe, Kazuaki; and Nakamura, Shinya, 4,441,385, Cl. 74-867.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,441,594, Cl. 192-3.280.
Nakamura, Yukio, 4,441,465, Cl. 123-90.340.
Sakurada, Okinobu, 4,441,370, Cl. 73-651.000.
Toyoda, Shuhei; and Tanahashi, Toshio, 4,441,464, Cl. 123-52.0MB.
Transamerica Delaval Inc.: *See*—
Ritzi, Emil W., 4,441,322, Cl. 60-649.000.
Transporation Design Technology, Inc.: *See*—
Thorley, Graham R., 4,441,850, Cl. 414-545.000.
Traunecker, Werner: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,442,120, Cl. 424-282.000.
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,442,121, Cl. 424-282.000.
Trayer, Frank C. Method and apparatus for short circuit protection of high voltage distribution systems. 4,442,471, Cl. 361-63.000.
TRE Semiconductor Equipment Corp.: *See*—
Giacomelli, Thomas P., 4,441,808, Cl. 355-53.000.
Treidl, Bernhard L. Telephone accessible appliance control system. 4,442,319, Cl. 179-2.00A.
Tremmel, Robert A., to OMI International Corporation. Coumarin process and nickel electroplating bath. 4,441,969, Cl. 204-49.000.
Trijzelaar, Hans B.; de Bode, Ronus; and Welle, Hendricus B. A., to ACF Chemiefarma N.V. Quinoline derivatives, pharmaceutical compositions containing such compounds, and methods of treating cardiovascular conditions with them. 4,442,106, Cl. 424-258.000.
Trijzelaar, Hans B.; de Bode, Ronus; and Welle, Hendricus B. A., to ACF Chemiefarma N.V. Quinoline derivatives, pharmaceutical compositions containing such compounds, and methods for treating cardiovascular conditions with them. 4,442,107, Cl. 424-258.000.
Tropic Industries, Inc.: *See*—
Goott, Joseph, 4,441,714, Cl. 273-144.00B.
True, Duane A.: *See*—
Hicken, Michael G.; Kirschensteiner, Fred; True, Duane A.; and Taleff, Alexander, 4,441,242, Cl. 29-419.00R.
Trumble, William P.; Martin, Ivan E.; and Berthiaume, Clement E., to Northern Telecom Limited. Flexible tear resistant protective glove for use on high voltage systems. 4,441,213, Cl. 2-161.00R.
Trust, Marshall County Bank and, executor: *See*—
Naylor, Donald B., deceased, 4,441,277, Cl. 49-380.000.
Trutzschler GmbH & Co. KG: *See*—
Beneke, Wolfgang; and Leifeld, Ferdinand, 4,441,994, Cl. 209-139.00R.
TRW Inc.: *See*—
Shoup, Thomas E., 4,442,336, Cl. 219-98.000.
Trybom, Stig H. E. Position adjusting device for sanitary and plumbing units using water under pressure. 4,441,218, Cl. 4-252.00R.
Tsai, Tsu-Tzu; and Arnold, Fred E., to United States of America, Air Force. Di-acetylenyl-substituted 2-phenylbenzothiazoles. 4,442,293, Cl. 548-152.000.
Tsao, Jung-Hsien; and Hein, Paul R., to W. R. Grace & Co. Polymer composition having terminal alkene and terminal carboxyl groups. 4,442,198, Cl. 430-311.000.
Tsolis, Alexandros K. N-(Substituted phosphinyl) polyamides. 4,442,268, Cl. 525-420.000.
Tsuchida, Takayasu; Miwa, Kiyoshi; and Nakamori, Shigeru, to Ajinomoto Co., Inc. Method for producing L-isoleucine by fermentation. 4,442,208, Cl. 435-116.000.

Tsuge, Noboru; Shimogawa, Toshiaki; Kuwakado, Satosi; and Takei, Toshihiro, to Nippon Soken, Inc. Seat belt tensioning device. 4,441,738, Cl. 280-806.000.

Tsuhako, Parker I., to Ohline Corporation. Bottom rail structural configuration for a venetian blind. 4,441,540, Cl. 160-168.00R.

Tsujimoto, Haruo. Water level detector apparatus of float type. 4,441,860, Cl. 417-40.000.

Tsujimura, Kazunari; and Hadano, Yoshikazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Steam turbine for geothermal power generation. 4,441,856, Cl. 415-155.000.

Tsukamoto, Katsuhiro: *See*—
Akasaka, Yoichi; and Tsukamoto, Katsuhiro, 4,441,932, Cl. 148-1.500.

Tsunekawa, Masayoshi; Yoshida, Shinzo; and Komura, Tamotsu, to Sankin Industry Co., Ltd. Phosphate derivatives, process for producing phosphate derivatives and fillers for human hard tissues containing the same. 4,442,239, Cl. 523-116.000.

Tsutsumi, Teruo, to Tokyo Shibaura Denki Kabushiki Kaisha. Pressure fixing device. 4,441,416, Cl. 100-171.000.

Tsuzuki, Yoshihiko: *See*—
Shirasaki, Shinji; Tsuzuki, Yoshihiko; Hirabayashi, Yuzi; Okazaki, Hiroshi; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,442,424, Cl. 340-52.00F.

Tubettificio Ligure S.p.A.: *See*—
Bodega, Sergio, 4,441,354, Cl. 72-342.000.

Tults, Juri, to RCA Corporation. Counter arrangement useful in a frequency locked loop tuning system for measuring the frequency of a local oscillator signal. 4,442,547, Cl. 455-180.000.

Tune, Joel A., to Baxter Travenol Laboratories, Inc. Heatseal plug with resealing feature. 4,441,620, Cl. 215-232.000.

Tupa, John T.: *See*—
Borovicka, David A., Sr.; Hahn, Kenneth G., Jr.; and Tupa, John T., 4,442,257, Cl. 524-555.000.

Turcke, Rainer: *See*—
Nagel, Erich; and Turcke, Rainer, 4,441,702, Cl. 271-177.000.

Tyryshkina, Galina B.: *See*—
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,441,549, Cl. 165-145.000.

Uchida, Isamu; and Imamura, Yoshiyuki, to Luarel Bank Machine Co., Ltd. Three direction changeable guide device for use in a bank note handling machine. 4,441,704, Cl. 271-303.000.

Uchida, Ryohei; Yamasaki, Tatsuo; Idei, Toshio; Tatsutani, Toshio; and Hagiwara, Ippei, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus of transistor motor. 4,442,386, Cl. 318-254.000.

Uchida, Yoko: *See*—
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; Fukino Tadashi; and Yoshida, Minoru, 4,442,360, Cl. 250-486.100.

Uchimura, Tosio: *See*—
Nagahara, Hiroshi; and Uchimura, Tosio, 4,441,691, Cl. 254-344.000.

Ueda, Ichiro: *See*—
Ouchi, Hiromu; Kawashima, Syunichiro; Nishida, Masamitsu; and Ueda, Ichiro, 4,442,220, Cl. 501-139.000.

Ueda, Yoshihiko, to Takara Kogyo Co., Ltd., a part interest. Water purification device. 4,441,998, Cl. 210-275.000.

Uemura, Yahiro: *See*—
Arakawa, Yoshio; Takanabe, Atsuyuki; Uemura, Yahiro; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,442,037, Cl. 260-397.200.

Ueno, Sadayasu, to Hitachi, Ltd. Combustion sensing apparatus. 4,441,982, Cl. 204-426.000.

Ufrecht, Martin: *See*—
Rest, Heinz; and Ufrecht, Martin, 4,441,463, Cl. 123-41.270.

Ugon, Michel: *See*—
Mollier, Jean H.; and Ugon, Michel, 4,442,345, Cl. 235-380.000.

Uhl, Larry A., to Shan-Rod, Inc. Heat and vibration resistant seal. 4,441,726, Cl. 277-230.000.

Ulland, Hartmut: *See*—
Schutt, Dieter; Schwengler, Manfred; Ulland, Hartmut; and Weis, Helmut H., 4,442,503, Cl. 364-900.000.

Umezawa, Hidetsugu; Ogasawara, Takashi; and Shimazaki, Haruo, to Nissan Motor Co., Ltd. Weft detaining device of shuttleless loom. 4,441,531, Cl. 139-452.000.

Underbrink, Gary L.; Wilkes, Lambert H.; and Jones, Joseph K., to Cotton, Incorporated. Method and apparatus for removing a fiber fraction from seed cotton. 4,441,232, Cl. 19-48.00R.

Underwood, Herbert N., to Borg-Warner Corporation. Folding bicycle. 4,441,729, Cl. 280-278.000.

Unimation, Inc.: *See*—
Lindbom, Torsten H., 4,442,387, Cl. 318-568.000.

Union Carbide Corporation: *See*—
Elek, Louis F.; and Frost, Albert C., 4,441,893, Cl. 48-197.00R.
Fuderer, Andrija, 4,442,020, Cl. 252-373.000.
Jackson, John E.; and Doherty, William G., 4,441,857, Cl. 415-213.00R.
Spanur, Frank G., 4,442,184, Cl. 429-54.000.
Swallow, Brian R., 4,441,900, Cl. 62-29.000.
Urry, Lewis F., 4,442,186, Cl. 429-142.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Higton, Malcolm; and Vechi, Aron, 4,442,377, Cl. 313-503.000.
Tayler, Colin A. M., 4,441,855, Cl. 415-53.00T.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Energy in Her Britannic Majesty's Government of the: *See*—
Moody, George W., 4,441,316, Cl. 60-398.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Social Services in Her Britannic Majesty's Government of the: *See*—
Colman, Geoffrey; and Russell, Roy R. B., 4,442,085, Cl. 424-49.000.

United States Government: *See*—
Tippetts, Thomas B.; and Manion, Francis M., 4,441,525, Cl. 137-814.000.

United States of America
Air Force: *See*—
Bricks, Bernard G., 4,442,523, Cl. 372-56.000.
Roth, Roger R., 4,442,514, Cl. 367-136.000.
Smith, John R., 4,441,312, Cl. 60-245.000.
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,442,293, Cl. 548-152.000.
Verdier, James E., 4,442,453, Cl. 358-109.000.
Army: *See*—
Apel, Thomas R., 4,442,407, Cl. 330-128.000.
Hrubesh, Charles F., 4,441,532, Cl. 141-1.000.
Malik, Roger J.; and AuCoin, Thomas R., 4,442,445, Cl. 357-22.000.
Pohlmann, Juergen L. W.; and Martinka, Michael, 4,441,967, Cl. 204-29.000.
Sayles, David C., 4,441,942, Cl. 149-19.600.
Energy: *See*—
Brau, Charles A.; Kurnit, Norman A.; and Cooper, Richard K., 4,442,522, Cl. 372-2.000.
Downhower, Francis H., Jr.; and Finlayson, Paul T., 4,442,480, Cl. 363-57.000.
Fischer, William H.; Cookson, Alan H.; and Yoon, Kue H., 4,442,311, Cl. 174-14.00R.
Fischer, William H.; and Yoon, Kue H., 4,442,313, Cl. 174-28.000.
Greenbaum, Elias, 4,442,211, Cl. 435-168.000.
Hencken, Kenneth R.; Tichenor, Daniel A.; and Wang, James C. F., 4,441,816, Cl. 356-335.000.
Jalan, Vinod M.; and Frost, David G., 4,442,078, Cl. 423-230.000.
Rand, Peter B., 4,442,018, Cl. 252-307.000.
Skotheim, Terje, 4,442,185, Cl. 429-111.000.
Weitl, Frederick L.; and Raymond, Kenneth N., 4,442,305, Cl. 562-451.000.
Wolf, Gary A.; Smith, Jeffrey W.; and Ihle, Nathan C., 4,442,028, Cl. 252-628.000.
Health and Human Services: *See*—
Hamer, Dean H.; and Gerin, John, 4,442,205, Cl. 435-68.000.
Interior: *See*—
Baglin, Elizabeth G.; and Gomes, John M., 4,442,072, Cl. 423-22.000.
Navy: *See*—
Bouley, Alan C.; Riedl, Harold R.; Jensen, James D.; and Jost, Steven R., 4,442,446, Cl. 357-30.000.
Franklin, James L.; and Kramer, Ted J., 4,442,475, Cl. 361-383.000.
Holtrop, John W., 4,441,674, Cl. 244-137.00R.
Kaufman, Martin H., 4,442,142, Cl. 427-316.000.
Kim, Chulho; and Weimer, Raymond J., 4,441,237, Cl. 29-1.200.
Price, Abner B.; and Burnley, William S., III, 4,441,429, Cl. 102-526.000.
Rashleigh, Scott C., 4,442,350, Cl. 250-227.000.

U.S. Philips Corporation: *See*—
Baker, Geoffrey; and Lockett, Roger A., 4,442,357, Cl. 250-338.000.
Killat, Ulrich, 4,442,550, Cl. 455-608.000.
Mayer, Robert T., 4,442,486, Cl. 364-200.000.
Mikkers, Franciscus E. P.; and Wierenga, Peter E., 4,441,964, Cl. 204-15.000.
Van Der Waal, Jan; and Compen, Johannes M. A. A., 4,442,376, Cl. 313-402.000.
Wagner, Wolfgang, 4,442,489, Cl. 364-414.000.

United Technologies Corporation: *See*—
Fitton, David L., 4,441,314, Cl. 60-266.000.
Kalmanash, Michael H.; and Young, Edward L., 4,442,451, Cl. 358-73.000.
Lemkey, Franklin D.; and Thompson, Earl R., 4,441,939, Cl. 148-31.000.
Rotondo, Claude P.; and Robinson, John D., Jr., 4,441,311, Cl. 60-39.080.
Urbanik, Peter J., 4,442,423, Cl. 340-347.00P.

Unitika Ltd.: *See*—
Sumi, Masao; Suenaga, Junichi; Takenaka, Masazo; Murano, Itaru; Tanabe, Mikio; and Hirai, Kiyoshi, 4,442,252, Cl. 524-183.000.

Universal Pioneer Corporation: *See*—
Funabashi, Tadashi, 4,442,516, Cl. 369-43.000.

University of Akron, The: *See*—
Kennedy, Joseph P.; and Frisch, Kurt C., Jr., 4,442,261, Cl. 525-324.000.

University of Oklahoma, The Board of Regents for the: *See*—
Magarian, Robert A.; and Pento, Joseph T., 4,442,119, Cl. 424-274.000.

University Patents, Inc.: *See*—
MacDiarmid, Alan G.; Heeger, Alan J.; and Nigrey, Paul J., 4,442,187, Cl. 429-213.000.

Robinson, Douglas J.; and Ette, Aniedi O., 4,442,073, Cl. 423-54.000.

UOP Inc.: *See*—
Neuzil, Richard W.; and Priegnitz, James W., 4,442,285, Cl. 536-127.000.

Upjohn Company, The: *See*—
Sacks, Clifford E., 4,442,035, Cl. 260-239.55R.

Urbanik, Peter J., to United Technologies Corporation. Optical position sensor including a specially designed encoder plate. 4,442,423, Cl. 340-347.00P.

Urry, Lewis F., to Union Carbide Corporation. Porous annulus providing gas channels between electrode compartments. 4,442,186, Cl. 429-142.000.

Ushida, Mituo: *See*—
Iwasa, Tadanobu; and Ushida, Mituo, 4,442,167, Cl. 428-323.000.

Ushida, Yoshihisa: *See*—
Kashiwa, Norio; and Ushida, Yoshihisa, 4,442,276, Cl. 526-125.000.

Ushijima, Yuji: *See*—
Yoneda, Kenji; Sanezawa, Fumio; Takagi, Yasuo; and Ushijima, Yuji, 4,441,468, Cl. 123-198.00E.

USM Corporation: *See*—
Gordiski, Ronald J., 4,441,281, Cl. 51-165.870.

Utah State University Foundation: *See*—
Hill, Geoffrey E.; Woffinden, Duard S.; and Chadwick, Duane G., 4,441,363, Cl. 73-170.00R.

Utsunomiya, Yumiteru; and Murayama, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Cooling device for rotary electric machine. 4,442,371, Cl. 310-260.000.

Vacuumschmelze GmbH: *See*—
Pfeifer, Friedrich; and Kessler, Willi, 4,441,940, Cl. 148-121.000.

Vahlensieck, Jurgen: *See*—
Lux, Werner; Vahlensieck, Jurgen; Zell, Jakob; Hermann, Bodo; Bartsch, Heinz; and Zimmermann, Horst, 4,442,334, Cl. 219-73.000.

Valeo: *See*—
Bochot, Jean C., 4,441,315, Cl. 60-345.000.
Caray, Andre, 4,441,600, Cl. 192-89.00B.

Valmet Oy: *See*—
Vedenpa , Timo, 4,441,263, Cl. 34-115.000.

van den Heuvel, Anthony P.: *See*—
Epsom, Robert L.; Gailus, Paul H.; and van den Heuvel, Anthony P., 4,442,416, Cl. 333-263.000.

van der Hauw, Tjerk; and Jaspers, Hans, to Akzona, Inc. Photopolymerizable composition, photoinitiator mixture and curing process. 4,442,022, Cl. 502-150.000.

VanderVaart, Gerry, to Kool-Fire Limited. Method of operating a heat-augmented heat pump system. 4,441,546, Cl. 165-29.000.

Van Der Waal, Jan; and Compen, Johannes M. A. A., to U.S. Philips Corporation. Color display tube having heavy metal coating on color selection electrode. 4,442,376, Cl. 313-402.000.

van der Weerdt, Antonius J. A.: *See*—
Boelens, Harmannus; van der Weerdt, Antonius J. A.; and Hesp, Theodorus G. M., 4,442,025, Cl. 252-522.00R.

Van Dyck, Francis S.; and Dumortier, Thierry M., to Fabrique Nationale Herstal. Metallic tennis racket with torsion-resistant handle. 4,441,713, Cl. 273-73.00J.

Van Dyke, Steve: *See*—
Friend, George E.; Meyers, John D.; and Van Dyke, Steve, 4,442,502, Cl. 364-900.000.

van Kaam, Marinus L. G.: *See*—
Oostenbrink, Albertus A.; Negen, Anno G.; and van Kaam, Marinus L. G., 4,441,744, Cl. 285-162.000.

Van Leirsburg, Dean A.: *See*—
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,442,074, Cl. 423-54.000.

Van Sickle, Robert J., to Power Distribution, Inc. Variable frequency drive for a motor-generator/alternator set. 4,442,385, Cl. 318-140.000.

Vapor Energy, Inc.: *See*—
Wyatt, William G., 4,441,460, Cl. 122-31.00R.

Varian Associates, Inc.: *See*—
Symons, Robert S., 4,442,417, Cl. 335-210.000.

Varon, David S.; and Siegal, Burton L., to Crown Metal Manufacturing Company. Bracket support for wall studs. 4,441,300, Cl. 52-732.000.

Varshavsky, Alexander J., to Massachusetts Institute of Technology. Gene amplification assay for detecting tumor promoters. 4,442,203, Cl. 435-6.000.

Vartiainen, Jorma, to Plan-Sell Oy. Apparatus and method for aligning lumber. 4,441,537, Cl. 144-357.000.

Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., to Belgorodsky Zavod Energeticheskogo Mashinostroenia. Heat exchanger within dense gravity layer. 4,441,549, Cl. 165-145.000.

Vaught, Ronald R. Grating cable hanger. 4,441,583, Cl. 182-150.000.

Vavala, Louis M., to Allied Corporation. Dyeing method for control of multicolored pattern nylon carpet. 4,441,883, Cl. 8-457.000.

Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Naumann, Johannes; Pohl, Wolfgang; and Forster, Karl-Heinz, 4,441,424, Cl. 101-248.000.

Vecht, Aron: *See*—
Higton, Malcolm; and Vecht, Aron, 4,442,377, Cl. 313-503.000.

Vectra International Corporation: *See*—
Buirley, William L.; Koopman, Donald E.; McQuain, David B.; and Reeves, William H., 4,441,508, Cl. 128-736.000.

Vedenpa , Timo, to Valmet Oy. Device in the drying section of a paper machine. 4,441,263, Cl. 34-115.000.

Veltman, Preston L.: *See*—
Donelly, James R.; Felsvang, Karsten S.; Morsing, Per; and Veltman, Preston L., 4,442,079, Cl. 423-239.000.
Donnelly, James R.; Felsvang, Karsten S.; Morsing, Per; and Veltman, Preston L., 4,442,080, Cl. 423-239.000.

Veno, Tsuneya: *See*—
Asari, Akira; Yamamura, Takashige; and Veno, Tsuneya, 4,441,353, Cl. 72-316.000.

Venus Scientific Inc.: *See*—
Gallios, George C., 4,442,482, Cl. 363-61.000.

Verdier, James E., to United States of America, Air Force. Photoreconnaissance system. 4,442,453, Cl. 358-109.000.

Vereinigte Aluminium-Werke A.G.: *See*—
Wilkening, Siegfried, 4,441,920, Cl. 75-10.00R.

Verhaegen, Paul. Heat-recovery device for open hearth. 4,441,481, Cl. 126-121.000.

Verhoeven, Teunes: *See*—
Boehringer, Wilfred E.; and Verhoeven, Teunes, 4,441,675, Cl. 244-213.000.

Vernitron Corporation: *See*—
Rickman, Mark A.; and Leonard, Murray, 4,441,480, Cl. 126-42.000.

Veyssiere, Gerard, to Ducellier & Cie. Brush lead retainer for an electrical machine. 4,442,370, Cl. 310-239.000.

Viale, Alain: *See*—
Bouverot, Noel; Medard, Paul; and Viale, Alain, 4,442,060, Cl. 264-328.200.

Victor Company of Japan, Limited: *See*—
Ishigaki, Yukinobu, 4,442,546, Cl. 455-72.000.

Victoreen, Inc.: *See*—
Simon, William E.; and Richards, Richard D., 4,442,496, Cl. 364-524.000.

Virginia Industries, Inc.: *See*—
Mullen, Gerald H., 4,441,239, Cl. 29-148.40A.

Vivlamore, Samantha L.: *See*—
Myers, Donald W.; and Vivlamore, Samantha L., 4,442,064, Cl. 264-551.000.

Voell, Erich: *See*—
Wetzels, Walter; Crott, Kurt; and Voell, Erich, 4,441,280, Cl. 51-103.00R.

Voest-Alpine Aktiengesellschaft: *See*—
Steinmair, Karl, 4,441,661, Cl. 242-55.000.

Vogel, Benjamin, to Haskel, Inc. Synchronized mixing pump. 4,441,862, Cl. 417-250.000.

Vognsen, Anders M.; and Boisen, Henrik, to Vognsen, Anders Marius. Element-rich composition. 4,442,215, Cl. 435-262.000.

Vognsen, Anders Marius: *See*—
Vognsen, Anders M.; and Boisen, Henrik, 4,442,215, Cl. 435-262.000.

Volk, Richard: *See*—
Oelsch, Jurgen; Volk, Richard; and Claussen, Karl-Heinz, 4,442,055, Cl. 264-105.000.

Vollmuth, Lawrence P.: *See*—
Hijuelos, Humberto; Scartozzi, Giulio; Vollmuth, Lawrence P.; and Basile, Raffaele, 4,441,238, Cl. 29-33.00D.

Voltin, John A.: *See*—
Krishnamurty, Rajan; and Voltin, John A., 4,442,463, Cl. 360-60.000.

von Holdt, John W. Threaded port and plug having access apertures. 4,441,622, Cl. 217-99.000.

von Schuckmann, Alfred: *See*—
Fleischer, Willy; and von Schuckmann, Alfred, 4,441,758, Cl. 297-439.000.

Voorn, Francesco G. M.: *See*—
Foederer, Wilhelmus T. M.; and Voorn, Francesco G. M., 4,441,779, Cl. 339-99.00R.

Voss, Earl W., to Diversified Electronics, Inc. Frequency monitor with adjustable tolerance. 4,442,406, Cl. 328-134.000.

W. R. Grace & Co.: *See*—
Isgur, Irving E.; and DelVecchio, William D., 4,442,259, Cl. 524-839.000.
Morrell, Roberto I.; and Peters, Charles F., 4,442,081, Cl. 423-321.00R.
Stierli, Robert F., 4,442,148, Cl. 428-40.000.
Tsao, Jung-Hsien; and Hein, Paul R., 4,442,198, Cl. 430-311.000.

W. R. Grace & Co., Cryovac Division: *See*—
Schirmer, Henry G., 4,442,147, Cl. 428-35.000.

W. Schlafhorst & Co.: *See*—
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, 4,441,308, Cl. 57-22.000.

Waagner Biro Aktiengesellschaft: *See*—
Beckmann, Georg, 4,441,261, Cl. 34-20.000.

WABCO Fahrzeugbremsen GmbH: *See*—
Fauck, Gerhard; and Kiel, Bernd-Joachim, 4,441,763, Cl. 303-23.00R.
Staisch, Diether, 4,441,865, Cl. 417-319.000.

Wada, Naohisa: *See*—
Wolfe, Denis G.; and Wada, Naohisa, 4,441,317, Cl. 60-527.000.

Wagensommer, Joseph: *See*—
Thaler, Warren A.; Walker, Thad O.; Lundberg, Robert D.; and Wagensommer, Joseph, 4,442,011, Cl. 252-8.50M.

Wagle, William F., to Emhart Industries, Inc. Drive means for a timing mechanism. 4,442,326, Cl. 200-38.00R.

Wagner, Alfred; Ames, Adolf; and Hodel, Ulf, to Swiss Aluminium Ltd. Process for manufacturing plastically deformed light metal

objects and shaped bodies having a light metal part. 4,441,646, Cl. 228-116.000.

Wagner, Kuno: *See*—
Fauss, Rudolf; Sonntag, Michael; Wagner, Kuno; Findeisen, Kurt; and Mennicken, Gerhard, 4,442,279, Cl. 528-44.000.

Wagner, Ulrich; and Buschulte, Winfried, to M.A.N. Maschinenfabrik Augsburg-Nurnberg; and Deutsche Forschungs-und Versuchsanstalt fur Luft- und Raumfahrt E.V. Oil and gas burner for installation in heating and stream-producing boilers. 4,441,879, Cl. 431-284.000.

Wagner, Wolfgang, to U.S. Philips Corporation. Device for computed tomography. 4,442,489, Cl. 364-414.000.

Waite, Frederick A.: *See*—
Brooks, Herbert; and Waite, Frederick A., 4,442,272, Cl. 526-82.000.

Waites, Geoffrey M. H.: *See*—
Rathbone, Elner B.; Waites, Geoffrey M. H.; and Ford, William C. L., 4,442,123, Cl. 424-308.000.

Wakai, Hideyuki; Kashimoto, Masataka; Sakamoto, Chiaki; and Mizutani, Eiji, to Kabushiki Kaisha Komatsu Seisakusho. Cutting tool retreat and return for workpiece protection upon abnormality occurrence in a preprogrammed machine tool. 4,442,493, Cl. 364-475.000.

Wake, Lewis F.: *See*—
Alter, Hobart L.; Wake, Lewis F.; and Platten, Myron G., 4,441,447, Cl. 114-167.000.

Wakitani, Mitsuru: *See*—
Takegami, Shinsuke; Ban, Kaoru; and Wakitani, Mitsuru, 4,442,173, Cl. 428-372.000.

Wakoh, Shoji: *See*—
Toba, Hirotaka; Itoh, Masanori; Nakano, Keita; Wakoh, Shoji; Toyoshima, Toshihiko; and Todo, Hidemasa, 4,442,160, Cl. 428-215.000.

Walker, Frank H.: *See*—
Bruso, Frederick G.; Walker, Frank H.; and Lyon, Harry H., 4,441,520, Cl. 137-44.000.

Walker, Thad O.: *See*—
Thaler, Warren A.; Walker, Thad O.; Lundberg, Robert D.; and Wagensommer, Joseph, 4,442,011, Cl. 252-8.50M.

Wallace Murray Corporation: *See*—
Shepherd, Michael, 4,441,598, Cl. 192-58.00B.

Walling, Joerg-Heim J.: *See*—
Porter, John F.; Walling, Joerg-Heim J.; and Axiuk, Oleg, 4,441,961, Cl. 162-106.000.

Walter, Bert: *See*—
Greenquist, Alfred C.; and Walter, Bert, 4,442,204, Cl. 435-7.000.

Walters, Gerald E., to Automation Industries, Inc. Coupling and decoupling aid for an electrical connector. 4,441,775, Cl. 339-89.00R.

Walters, Gerald E., to Automation Industries, Inc. Plug and receptacle electrical connector. 4,441,780, Cl. 339-143.00R.

Walton Energy Systems Co.: *See*—
Roberts, Walter M., 4,442,372, Cl. 310-339.000.

Walton, Richard E., II, to Black & Decker Inc. Tool collet and control means. 4,441,563, Cl. 173-163.000.

Wang, James C. F.: *See*—
Heacken, Kenneth R.; Tichenor, Daniel A.; and Wang, James C. F., 4,441,816, Cl. 356-335.000.

Wang, Richard: *See*—
Liou, Tony; and Wang, Richard, 4,441,756, Cl. 297-39.000.

Ward, James H., Jr., to B. F. Goodrich Company, The. Escape slide system and method of operation. 4,441,582, Cl. 182-48.000.

Warne, Michael A., to Global Cathodic Protection Ltd. Apparatus for determining underwater potential differences employing Luggins tubulus. 4,441,980, Cl. 204-409.000.

Warren, Philip H.: *See*—
Jackson, William B.; Harvey, Ian G.; and Warren, Philip H., 4,442,332, Cl. 219-10.670.

Watanabe, Kazuaki: *See*—
Taga, Yutaka; Watanabe, Kazuaki; and Nakamura, Shinya, 4,441,385, Cl. 74-867.000.

Watanabe, Koji; Higuchi, Yoshihiro; Yagi, Michio; and Shiozawa, Kazuo, to Konishiroku Photo Industry Co., Ltd. Camera having a liquid crystal focusing screen. 4,441,798, Cl. 354-483.000.

Watanabe, Yasuo, to Dai Ichi High Frequency Company, Ltd. Method and apparatus of induction heating a metallic elongated material having different thickness sections. 4,442,331, Cl. 219-10.430.

Watkins, Dale F.: *See*—
Franklin, James L.; and Watkins, Dale F., 4,441,548, Cl. 165-104.260.

Watkins, Hugh: *See*—
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,442,012, Cl. 252-8.600.

Watson, Kenneth; Buswell, Richard G.; and Saunders, James E., to Westland plc. Freewheel devices. 4,441,384, Cl. 74-665.0GA.

Watts, Donald R. Pipe cutting machine. 4,441,695, Cl. 266-57.000.

Watts, Edward E.: *See*—
Watts, Jeffrey E.; and Watts, Edward E., 4,441,864, Cl. 417-319.000.

Watts, Jeffrey E.; and Watts, Edward E. Hydraulic pump with a magnetically operated coupling. 4,441,864, Cl. 417-319.000.

Wavin B.V.: *See*—
Nicholas, Terry G., 4,441,745, Cl. 285-417.000.
Oostenbrink, Albertus A.; Negen, Anno G.; and van Kaam, Marinus L. G., 4,441,744, Cl. 285-162.000.
Steenbergen, Johannes F., 4,441,743, Cl. 285-21.000.

Webb, Shirley B.: *See*—
Ten Haken, Pieter; and Webb, Shirley B., 4,441,912, Cl. 71-92.000.

Weber, Wolfgang: *See*—
Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, 4,441,930, Cl. 134-2.000.

Webster, Michael P., to Steelcase Inc. Acoustical control media. 4,441,580, Cl. 181-286.000.

Wedral, Elaine R.; Hopefl, Richard M.; and Ivie, Rufus A., to Societe d'Assistance Technique pour Produits Nestle S.A. Coloring of fruit. 4,442,104, Cl. 426-250.000.

Weightman, Barry O.: *See*—
Evans, David M.; and Weightman, Barry O., 4,441,489, Cl. 128-77.000.

Weimer, Raymond J.: *See*—
Kim, Chulho; and Weimer, Raymond J., 4,441,237, Cl. 29-1.200.

Weinraub, William C. L., to Bell Telephone Laboratories, Incorporated. Zero torque helically wrapped cable. 4,441,309, Cl. 57-212.000.

Weis, Helmut H.: *See*—
Schutt, Dieter; Schwengler, Manfred; Ulland, Hartmut; and Weis, Helmut H., 4,442,503, Cl. 364-900.000.

Weisenberger, Johannes M.: *See*—
Muller, Erich; Nickl, Josef; Narr, Berthold; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,442,111, Cl. 424-263.000.

Weiss, Jorn-Volker; Riemer, Heinz; and Mutzberg, Friedhelm, to Chemische Werke Huels, AG. Emulsion based on epoxy resins and diammonium salts and its preparation. 4,442,245, Cl. 523-401.000.

Weisz, William, to Singer Company, The. Push-button control module for a sewing machine. 4,441,440, Cl. 112-158.00C.

Weitl, Frederick L.; and Raymond, Kenneth N., to United States of America, Energy. Polycatecholamide chelating agents. 4,442,305, Cl. 562-451.000.

Welch, Richard D.; and Mulder, John G., to Eastman Kodak Company. Web cinching and winding apparatus. 4,441,663, Cl. 242-65.000.

Welch, William R.; and Heard, Thomas J., to Otis Engineering Corporation. Valve. 4,441,558, Cl. 166-317.000.

Welle, Hendricus B. A.: *See*—
Trijzelaar, Hans B.; de Bode, Ronus; and Welle, Hendricus B. A., 4,442,106, Cl. 424-258.000.
Trijzelaar, Hans B.; de Bode, Ronus; and Welle, Hendricus B. A., 4,442,107, Cl. 424-258.000.

Wells, Calvin G.: *See*—
Malkowski, Joseph L.; and Wells, Calvin G., 4,441,379, Cl. 74-477.000.

Wenneis, Wolffried: *See*—
Lohmar, Ernst; and Wenneis, Wolffried, 4,442,233, Cl. 521-98.000.

Werner, Linda B.; and Werner, William A., to Custom Stamping Mfg. Co. Protective head shield. 4,441,214, Cl. 2-174.000.

Werner, William A.: *See*—
Werner, Linda B.; and Werner, William A., 4,441,214, Cl. 2-174.000.

Wesley, William M. Collapsible high speed extension for motor vehicles. 4,441,751, Cl. 296-1.00S.

West Electric Co., Ltd.: *See*—
Maruyama, Yuji; and Horinishi, Katsumi, 4,441,797, Cl. 354-416.000.

West, Frank L.; and Norton, Larry A., to Starline Products, Inc. Manually portable start control for electrically powered apparatus. 4,442,327, Cl. 200-51.00R.

WesTech Engineering, Inc.: *See*—
Davis, Kent L., 4,442,001, Cl. 210-402.000.

Westimayer, David A., to Deere & Company. Skid shoe mounting arrangement for snow blower. 4,441,266, Cl. 37-244.000.

Westinghouse Electric Corp.: *See*—
Abbondanti, Alberto, 4,442,393, Cl. 318-802.000.
Bich, George J.; Burke, Thomas M.; and Smith, James D. B., 4,442,138, Cl. 427-116.000.
Fromson, Robert E.; and Shum, Lanson Y., 4,442,494, Cl. 364-511.000.
Hicken, Michael G.; Kirschensteiner, Fred; True, Duane A.; and Taleff, Alexander, 4,441,242, Cl. 29-419.00R.
Holtzman, Barry L.; and Mercier, George E., 4,442,473, Cl. 361-275.000.
Lenderking, Bruce N.; and Bocklage, Casper J., Jr., 4,442,476, Cl. 361-395.000.
Misencik, John J., 4,442,470, Cl. 361-46.000.

Westland plc: *See*—
Watson, Kenneth; Buswell, Richard G.; and Saunders, James E., 4,441,384, Cl. 74-665.0GA.

Wetterlin, Kjell I. L.: *See*—
Olsson, O. A. Torsten; Svensson, Leif Å; and Wetterlin, Kjell I. L., 4,442,300, Cl. 560-66.000.

Wetzel, Victor H.: *See*—
Kotsifas, Peter N.; Wetzel, Victor H.; and Gilson, Richard W., 4,441,509, Cl. 128-757.000.

Wetzels, Walter; Crott, Kurt; and Voell, Erich, to Schumag GmbH. Device for centerless grinding of rotation-symmetrical surfaces on work pieces. 4,441,280, Cl. 51-103.00R.

Wexell, Dale R.: *See*—
Flannery, James E.; Shoup, Robert D.; and Wexell, Dale R., 4,442,175, Cl. 428-404.000.

Weyant, Lowell E., to Seabrook Blanching Corporation. Apparatus for blanching peanuts. 4,441,409, Cl. 99-523.000.

White Consolidated Industries, Inc.: *See*—
Johnson, Roger E., 4,442,047, Cl. 261-66.000.

White, Fred K., to American Hospital Supply Corporation. Collection tube for drawing samples of biological fluids. 4,441,373, Cl. 73-864.020.

White, William H.; Harbison, William C.; and Nelson, Gary L., to Swedlow, Inc. Coated substrate comprising a cured transparent abrasion resistant filled organo-polysiloxane coatings containing colloidal antimony oxide and colloidal silica. 4,442,168, Cl. 428-331.000.

Whittaker Corporation: *See*—
Harootion, Aramis, 4,441,777, Cl. 339-94.00M.

Wich, Harald, to Diehl GmbH & Co. Apparatus for the production of a guide pattern of light beams. 4,441,669, Cl. 244-3.130.

Wickman, Kjell J., to Pharos AB. Deflection unit. 4,441,818, Cl. 356-372.000.

Wierenga, Peter E.: *See*—
Mikkers, Franciscus E. P.; and Wierenga, Peter E., 4,441,964, Cl. 204-15.000.

Wiggins, Richard H.; Doddington, George; and Cato, Craig J., to Texas Instruments Incorporated. Interactive device for teaching musical tones or melodies. 4,441,399, Cl. 84-470.00R.

Wilhelm Leeser Gummi-und Kunststoffverarbeitung GmbH & Co., KG: *See*—
Neumann, Kurt; and Dietrich, Wolfgang, 4,442,174, Cl. 428-376.000.

Wilke, Charles F., to Dresser Industries, Inc. Stratified fuel injection for gaseous fuel internal combustion engine. 4,441,469, Cl. 123-295.000.

Wilkening, Siegfried, to Vereinigte Aluminium-Werke A.G. Method for the thermal production of metals. 4,441,920, Cl. 75-10.00R.

Wilkes, Lambert H.: *See*—
Underbrink, Gary L.; Wilkes, Lambert H.; and Jones, Joseph K., 4,441,232, Cl. 19-48.00R.

Wilkinson, William H., to Gas Research Institute. Absorption refrigeration and heat pump system. 4,441,332, Cl. 62-238.300.

Willcox, Leland J. Golf ball practice driving apparatus. 4,441,717, Cl. 273-201.000.

Williams, Brown F.: *See*—
Carlson, David E.; and Williams, Brown F., 4,442,310, Cl. 136-256.000.

Williams, David M.; and Curtis, Charles L. Lift truck safety mirror. 4,441,790, Cl. 350-302.000.

Williamson, Warren L.: *See*—
Dooley, Daniel J.; and Williamson, Warren L., 4,441,360, Cl. 73-119.00A.

Willy Fleischer Metalwarenfabrik GmbH & Co. KG: *See*—
Fleischer, Willy; and von Schuckmann, Alfred, 4,441,758, Cl. 297-439.000.

Wilson, James. Apparatus for cutting and/or grinding of tree stumps. 4,441,534, Cl. 144-2.00N.

Wilson, Thomas A. Conical shaped charge liner of depleted uranium. 4,441,428, Cl. 102-307.000.

Wilt, Daniel P.: *See*—
Besomi, Paul R.; Degani, Joshua; and Wilt, Daniel P., 4,442,402, Cl. 324-158.00D.

Wimmer, Robert; and Levai, Laslo, to Bayerische Motoren Werke A.G. Vehicle with a passive belt system. 4,441,737, Cl. 280-804.000.

Winkowski, Daniel A., to National Gypsum Company. Wood plank wallcovering system using widths of 3 to 8 inches. 4,442,151, Cl. 428-54.000.

Wissgott, Ulrich, to Societe d'Assistance Technique pour Produits Nestle S.A. Fruit coloring process. 4,442,105, Cl. 426-250.000.

Witt, Horst: *See*—
Schuette, Heinz G., 4,441,283, Cl. 52-57.000.

Wittwer, Arnold: *See*—
Mueller, Herbert; Axel, Hartmut; and Wittwer, Arnold, 4,442,306, Cl. 564-479.000.

Wladawsky-Berger, Irving: *See*—
Fletcher, Robert P.; Stein, David M.; and Wladawsky-Berger, Irving, 4,442,487, Cl. 364-200.000.

Woffinden, Duard S.: *See*—
Hill, Geoffrey E.; Woffinden, Duard S.; and Chadwick, Duane G., 4,441,363, Cl. 73-170.00R.

Wolcott, Richard A.: *See*—
Lee, John M.; Baumen, William C.; Wolcott, Richard A.; and Burba, John L., III, 4,442,230, Cl. 521-28.000.

Wolf, Gary A.; Smith, Jeffrey W.; and Ihle, Nathan C., to United States of America, Energy. Method for incorporating radioactive phosphoric acid solutions in concrete. 4,442,028, Cl. 252-628.000.

Wolfe, Denis G.; and Wada, Naohisa, to Robertshaw Controls Company. Piston and cylinder type thermal device part therefor and methods of making the same. 4,441,317, Cl. 60-527.000.

Wolfe, Marshall W.: *See*—
Rivkin, Bernard; and Wolfe, Marshall W., 4,441,680, Cl. 248-220.400.

Wolff, Siegfried: *See*—
Kuhner, Gerhard; Wolff, Siegfried; and Rothbuhr, Lothar, 4,442,163, Cl. 428-262.000.

Wood, Anna L., executrix: *See*—
Short, Edward H., III; Allen, Jerome D.; and Wood, Loren E., deceased, 4,441,350, Cl. 72-55.000.

Wood, Donald H.: *See*—
Jones, Robert E.; and Wood, Donald H., 4,442,519, Cl. 371-27.000.

Wood, Kenneth G. Fluid bearing. 4,441,571, Cl. 180-128.000.

Wood, Loren E., deceased: *See*—
Short, Edward H., III; Allen, Jerome D.; and Wood, Loren E., deceased, 4,441,350, Cl. 72-55.000.

Wood, Van E.: *See*—
Sherman, Rand C.; and Wood, Van E., 4,441,248, Cl. 29-574.000.

Woodhams, Raymond T. Reinforced resin composites. 4,442,243, Cl. 523-212.000.

Woodhouse, Ian: *See*—
Pickering, John; Woodhouse, Ian; and Ganendran, Araspillai N., 4,442,053, Cl. 264-36.000.

Wooten, Willis C.: *See*—
Passmore, David T.; Wooten, Willis C.; and McBride, Paul, 4,442,270, Cl. 525-440.000.

Worley, Michael W., deceased; and by Worley, Shauna, legal representative. Method and apparatus for fetal pH scalp studies. 4,441,510, Cl. 128-763.000.

Worley, Shauna, legal representative: *See*—
Worley, Michael W., deceased; and Worley, Shauna, legal representative, 4,441,510, Cl. 128-763.000.

Woven Electronics Corporation: *See*—
Piper, Douglas E., 4,442,314, Cl. 174-36.000.

Wright, Andrew C. W.; and Petruschke, John W., to Dzus Fastener Co., Inc. Adjustable quarter-turn fastener. 4,441,843, Cl. 411-349.000.

Wright, Derek E.: *See*—
Ramsden, Christopher A.; Knowles, Philip; Lewis, Edward J.; Lunt, Edward; and Wright, Derek E., 4,442,115, Cl. 424-269.000.

Wunder, Friedrich: *See*—
Leupold, Ernst I.; Schmidt, Hans-Joachim; Wunder, Friedrich; Arpe, Hans-Jurgen; and Hachenberg, Horst, 4,442,228, Cl. 518-714.000.

Wyatt, William G., to Vapor Energy, Inc. Apparatus for heating and utilizing fluids. 4,441,460, Cl. 122-31.00R.

Wyrepak Industries, Inc.: *See*—
Kovaleski, Joseph J., 4,441,692, Cl. 254-390.000.

Xerox Corporation: *See*—
Elchinger, Gilbert M., 4,442,440, Cl. 346-1.100.
Lu, Chin H.; and AuClair, Christopher J., 4,442,189, Cl. 430-45.000.
Moreland, John F.; and Stoffel, James C., 4,442,544, Cl. 382-53.000.
Pai, Damodar M., 4,442,192, Cl. 430-59.000.

Yagi, Michio: *See*—
Watanabe, Koji; Higuchi, Yoshihiro; Yagi, Michio; and Shiozawa, Kazuo, 4,441,798, Cl. 354-483.000.

Yahashi, Satoru: *See*—
Imamura, Ryuichi; Shimazaki, Kanzo; Yahashi, Satoru; Yamamoto, Takashi; and Yano, Noriyuki, 4,441,412, Cl. 99-601.000.

Yamada, Hiromichi: *See*—
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; Fukino Tadashi; and Yoshida, Minoru, 4,442,360, Cl. 250-486.100.

Yamada, Tomio: *See*—
Iwataki, Isao; Kaeriyama, Minoru; Matsui, Nobuo; and Yamada, Tomio, 4,442,116, Cl. 424-270.000.

Yamaguchi, Hiroyoshi: *See*—
Iwaki, Akio; Kita, Noriyasu; Sasazawa, Tatsuya; and Yamaguchi, Hiroyoshi, 4,442,196, Cl. 430-195.000.

Yamaguchi, Shohachiro: *See*—
Ishikura, Shinichi; Kanda, Kazunori; and Yamaguchi, Shohachiro, 4,442,247, Cl. 523-414.000.

Yamaguchi, Tadamasa: *See*—
Kawabata, Fumimaru; Shiga, Atsushi; and Yamaguchi, Tadamasa, 4,442,340, Cl. 219-137.0PS.

Yamaguchi, Toshiaki, to Kinugawa Rubber Industrial Co., Ltd. Window weather stripping and the manufacturing method. 4,442,156, Cl. 428-142.000.

Yamakami, Yoshiaki: *See*—
Hiraishi, Hisashi; Yamakami, Yoshiaki; and Shintani, Atsunobu, 4,441,926, Cl. 75-128.00A.

Yamamoto, Takashi: *See*—
Imamura, Ryuichi; Shimazaki, Kanzo; Yahashi, Satoru; Yamamoto, Takashi; and Yano, Noriyuki, 4,441,412, Cl. 99-601.000.

Yamamoto, Takeshi; and Goto, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Photosensitive composition and article with o-quinone diazide and 6-membered cyclic acid-anhydride. 4,442,195, Cl. 430-191.000.

Yamamura, Takashige: *See*—
Asari, Akira; Yamamura, Takashige; and Veno, Tsuneya, 4,441,353, Cl. 72-316.000.

Yamasaki, Tatsuo: *See*—
Uchida, Ryohei; Yamasaki, Tatsuo; Idei, Toshio; Tatsutani, Toshio; and Hagiwara, Ippei, 4,442,386, Cl. 318-254.000.

Yamashita, Keitaro; and Kashiwagi, Hiromi, to Hitachi Metals, Ltd. Toner cartridge. 4,441,636, Cl. 222-541.000.

Yamato Scale Company, Limited: *See*—
Hirano, Takashi, 4,441,567, Cl. 177-25.000.

Yamazaki, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Plasma etching apparatus. 4,442,338, Cl. 219-121.0PE.

Yanabu, Satoru; Tamagawa, Tohoru; and Funahashi, Takumi, to Tokyo Shibaura Denki Kabushiki Kaisha. DC Circuit breaker apparatus. 4,442,469, Cl. 361-4.000.

Yanagishita, Hitoshi: *See*—
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, 4,442,027, Cl. 252-574.000.

Yang, Ling-Kuo. Healthful quilt. 4,441,223, Cl. 5-494.000.

Yanma Agricultural Equipment Company Limited: *See*—
Imamura, Ryuichi; Shimazaki, Kanzo; Yahashi, Satoru; Yamamoto, Takashi; and Yano, Noriyuki, 4,441,412, Cl. 99-601.000.

Yano, Noriyuki: *See*—
Imamura, Ryuichi; Shimazaki, Kanzo; Yahashi, Satoru; Yamamoto, Takashi; and Yano, Noriyuki, 4,441,412, Cl. 99-601.000.

Yardney Electric Corporation: *See*—
Fields, Larry D., 4,441,997, Cl. 210-266.000.

Yaron, Giora: *See*—
Priel, Ury; Yaron, Giora; and Ebel, Mark S., 4,442,510, Cl. 365-218.000.

Yasuda, Takatoshi, to Sharp Kabushiki Kaisha. Sensor controlled cooking apparatus. 4,442,344, Cl. 219-497.000.

Yasui, Kazuomi: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; and Moriya, Koichi, 4,441,913, Cl. 71-94.000.

Yasunaga, Masao: *See*—
Hotta, Teruyuki; Kurokawa, Yoshiki; Nagasaku, Eiichi; and Yasunaga, Masao, 4,441,863, Cl. 417-281.000.

Yasuo, Higashibata: *See*—
Ikuo, Yamaguchi; Yasuo, Higashibata; and Masaru, Fujimura, 4,441,289, Cl. 52-167.000.

Yavordios, Dimitri: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,442,102, Cl. 424-250.000.

Yazu, Shuji: *See*—
Hara, Akio; and Yazu, Shuji, 4,442,180, Cl. 428-551.000.

Yelf, Jack T.: *See*—
Gillard, David F.; and Yelf, Jack T., 4,441,948, Cl. 156-189.000.

Yokoyama, Nobuo: *See*—
Kawabata, Nobuaki; Yokoyama, Nobuo; and Araki, Yoshihiko, 4,442,140, Cl. 427-154.000.

Yoneda, Kenji; Sanezawa, Fumio; Takagi, Yasuo; and Ushijima, Yuji, to Nissan Motor Company, Ltd. Secondary air supply system. 4,441,468, Cl. 123-198.00E.

Yoneda, Shigeo, to Sharp Kabushiki Kaisha. Thermal printer with print density control. 4,442,342, Cl. 219-216.000.

Yoon, Heeyoung; and Rutledge, Gerald D., to Conoco Inc. Alcohol dissociation and waste heat recovery process for automobiles. 4,441,461, Cl. 123-3.000.

Yoon, Kue H.: *See*—
Fischer, William H.; Cookson, Alan H.; and Yoon, Kue H., 4,442,311, Cl. 174-14.00R.
Fischer, William H.; and Yoon, Kue H., 4,442,313, Cl. 174-28.000.

Yorisue, Shozo, to Precision Fukuhara Works, Ltd. Two-piece yarn carriers for circular knitting machines. 4,441,339, Cl. 66-111.000.

Yoshida, Keiichiro. Method of and apparatus for producing metallic tape. 4,441,351, Cl. 72-189.000.

Yoshida Kogyo K. K.: *See*—
Kusayama, Masahiro, 4,441,235, Cl. 433-001.000.

Yoshida Kogyo K.K.: *See*—
Takahashi, Kihei, 4,441,438, Cl. 112-104.000.

Yoshida, Minoru: *See*—
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; Fukino Tadashi; and Yoshida, Minoru, 4,442,360, Cl. 250-486.100.

Yoshida, Nobutoshi: *See*—
Katayama, Masahiro; Yoshida, Nobutoshi; and Kuge, Tsukasa, 4,441,417, Cl. 100-176.000.

Yoshida, Satoshi; and Higashi, Hidejiro, to Pioneer Electronic Corporation. Microphone with vibration cancellation. 4,442,323, Cl. 179-110.00A.

Yoshida, Shinzo: *See*—
Tsunekawa, Masayoshi; Yoshida, Shinzo; and Komura, Tamotsu, 4,442,239, Cl. 523-116.000.

Yoshida, Takao: *See*—
Calderose, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,442,012, Cl. 252-8.600.

Yoshii, Sigeru: *See*—
Nagaoka, Kazuya; and Yoshii, Sigeru, 4,442,176, Cl. 346-208.000.

Yoshikumi, Chikao: *See*—
Maeda, Yuji; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,442,093, Cl. 424-236.000.

Yoshimoto, Teruo: *See*—
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,442,068, Cl. 420-584.000.

Yoshinobu, Murakami: *See*—
Matsuda, Shunsuke; Ito, Akio; Katsuaki, Mitani; Yoshinobu, Murakami; and Tooru, Tamura, 4,442,061, Cl. 264-328.700.

Yoshiyuki, Kazuhiko: *See*—
Endo, Toshiaki; and Yoshiyuki, Kazuhiko, 4,441,755, Cl. 296-93.000.

Young, Charles E.; and Drzewiecki, George, to Inco Limited. Wet electrostatic precipitator having removable nested hexagonal collector plates and magnetic aligning and rapping means. 4,441,897, Cl. 55-112.000.

Young, Edward L.: *See*—
Kalmanash, Michael H.; and Young, Edward L., 4,442,451, Cl. 358-73.000.

Young, John M.: *See*—
Jones, Gordon H.; and Young, John M., 4,442,127, Cl. 424-331.000.

Young, Ralph H.: *See*—
Chen, Chin H.; Young, Ralph H.; and Scozzafava, Michael, 4,442,193, Cl. 430-83.000.

Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., to Hercules Incorporated. Container forming process. 4,442,063, Cl. 264-532.000.

Yu-Kuang, Lee. Automatic control system for position following and reciprocating motion of a controlled object. 4,442,391, Cl. 318-663.000.

Yukio, Kobayashi: *See*—
Oshima, Hiroyo; Daisaku, Matsukuma; Yutaka, Kojima; Yukio, Kobayashi; and Koichi, Nagai, 4,442,172, Cl. 428-342.000.

Yusa, Haruhiko; Hoshino, Mitsuru; Kurosaki, Akira; Furusawa, Hironobu; and Sugitawa, Chikara, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Composition of polyester-block copolymer. 4,442,262, Cl. 525-69.000.

Yutaka, Kojima: *See*—
Oshima, Hiroyo; Daisaku, Matsukuma; Yutaka, Kojima; Yukio, Kobayashi; and Koichi, Nagai, 4,442,172, Cl. 428-342.000.

Yuyama, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Airconditioner with refrigerant temperature responsive controller for compressor bypass valve. 4,441,331, Cl. 62-196.300.

Zabrocki, Karl; and Pischtschan, Alfred, to Bayer Aktiengesellschaft. Graft rubbers for modifying thermoplastic moulding compositions. 4,442,264, Cl. 525-86.000.

Zafiroglu, Dimitri P.: *See*—
Kirayoglu, Birol; and Zafiroglu, Dimitri P., 4,442,161, Cl. 428-219.000.

Zasio, John; Cooke, Larry; and Paul, Raymond, to Storage Technology Partners (through STC Computer Research Corporation). System and method for calibrating electron beam systems. 4,442,361, Cl. 250-491.100.

Zauner, Otto, to Owens-Illinois, Inc. Vial tooling apparatus. 4,441,908, Cl. 65-109.000.

Zell, Jakob: *See*—
Lux, Werner; Vahlensieck, Jurgen; Zell, Jakob; Hermann, Bodo; Bartsch, Heinz; and Zimmermann, Horst, 4,442,334, Cl. 219-73.000.

Zengel, Hans: *See*—
Hentschel, Peter; Brodowski, Walter; and Zengel, Hans, 4,442,281, Cl. 528-79.000.

Zeugner, Horst: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,442,102, Cl. 424-250.000.

Zimmerman, Jos.: *See*—
Hahm, Gerhard H., 4,441,665, Cl. 242-129.000.

Zimmerman, Robert L.; and McDaniel, Kenneth G., to Texaco Inc. Novel aromatic amide polyols from the reaction of phthalic acid residues, alkylene glycols and amino alcohols. 4,442,237, Cl. 521-131.000.

Zimmerman, Robert L.; and Speranza, George P., to Texaco Inc. Aromatic amide polyols for rigid polyurethane foams. 4,442,238, Cl. 521-164.000.

Zimmermann, Horst: *See*—
Lux, Werner; Vahlensieck, Jurgen; Zell, Jakob; Hermann, Bodo; Bartsch, Heinz; and Zimmermann, Horst, 4,442,334, Cl. 219-73.000.

Zolner, Dieter H.; Rittmann, Friedrich; Dung, Herbert; Haremsa, Johannes; Bauer, Georg; Otto, Josef; Muhlenbeck, Josef; and Lauterbach-Dammler, Inge, to Arc Technologies Systems Ltd. Electrode for arc furnaces. 4,442,525, Cl. 373-93.000.

Zublin, Casper W., to Downhole Services, Inc. Method and device for hydraulic jet well cleaning. 4,441,557, Cl. 166-312.000.

Zumfeld, Heinz: *See*—
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, 4,441,308, Cl. 57-22.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF APRIL, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ballard, James W.; and Ballard, Larry R., to Bonnici, Charles. One-piece roof vent device and methods of constructing and utilizing same. Re. 31,549, Cl. 98-42.00R.

Ballard, Larry R.: *See*—
Ballard, James W.; and Ballard, Larry R., Re. 31,549, Cl. 98-42.00R.

Barbin, Robert L., to RCA Corporation. Electron beam and deflection yoke alignment for producing convergence of plural in-line beams. Re. 31,552, Cl. 315-13.00C.

Bjorke, Merlin D., to Honeywell Inc. Digital delay generator. Re. 31,551, Cl. 307-597.000.

Bonnici, Charles: *See*—
Ballard, James W.; and Ballard, Larry R., Re. 31,549, Cl. 98-42.00R.

Honeywell Inc.: *See*—
Bjorke, Merlin D., Re. 31,551, Cl. 307-597.000.

Isogai, Yo: *See*—
Shudo, Koichi; Okamoto, Toshihiko; Isogai, Yo; and Takahashi, Soshiro, Re. 31,550, Cl. 71-94.000.

Okamoto, Toshihiko: *See*—
Shudo, Koichi; Okamoto, Toshihiko; Isogai, Yo; and Takahashi, Soshiro, Re. 31,550, Cl. 71-94.000.

RCA Corporation: *See*—
Barbin, Robert L., Re. 31,552, Cl. 315-13.00C.

Shudo, Koichi; Okamoto, Toshihiko; Isogai, Yo; and Takahashi, Soshiro, to Shudo, Koichi; Okamoto, Toshihiko; Isogai, Yo; and Takahashi, Soshiro. N-(2-Chloro-4-pyridyl) ureas. Re. 31,550, Cl. 71-94.000.

Takahashi, Soshiro: *See*—
Shudo, Koichi; Okamoto, Toshihiko; Isogai, Yo; and Takahashi, Soshiro, Re. 31,550, Cl. 71-94.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
D'Alo, Herbert F.; Genese, Joseph N.; and Smith, Ronald W., 273,419, Cl. D24-8.000.

Abe, Takeshi; Shibayama, Masato; Asakawa, Yoshifumi; and Kinoshita, Seiji, to Hitachi, Ltd. Telephone. 273,381, 4-10-84, Cl. D14-53.000.

Accessories by Pearl: *See*—
Degenshein, Edward D., 273,345, Cl. D2-414.000.

Adkins, Helen D. Gameboard. 273,402, 4-10-84, Cl. D21-35.000.

Adler, Morton S. Tool rest for a lathe. 273,386, 4-10-84, Cl. D15-138.000.

Adolfsson, Roger, to Cederroths AB. Wall mounted holder for the exposure of various kinds of bandaging materials. 273,352, 4-10-84, Cl. D6-130.000.

Albert, Howard. Boxing glove. 273,343, 4-10-84, Cl. D2-361.000.

Alfirevic, Radivoj. Food dispenser. 273,357, 4-10-84, Cl. D7-306.000.

Appliance Design Probe Inc.: *See*—
Barradas, George, 273,427, Cl. D28-38.000.

Asakawa, Yoshifumi: *See*—
Abe, Takeshi; Shibayama, Masato; Asakawa, Yoshifumi; and Kinoshita, Seiji, 273,381, Cl. D14-53.000.

Barradas, George, to Appliance Design Probe Inc. Hair setting case. 273,427, 4-10-84, Cl. D28-38.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Gevert, Klaus V., 273,339, Cl. D2-232.000.

Bulgari, Marina, to Zoldia Anstalt. Earring face. 273,371, 4-10-84, Cl. D11-56.000.

Cafiero, Vincent, to Simmons Universal Corporation. Arm chair. 273,349, 4-10-84, Cl. D6-31.000.

Cafiero, Vincent, to Simmons Universal Corporation. Arm chair. 273,350, 4-10-84, Cl. D6-31.000.

Callaway, Wayne: *See*—
Risch, Richard S.; and Callaway, Wayne, 273,348, Cl. D3-36.000.

Campbell, Andrew E.; and LeVan, Jack. Flashlight. 273,425, 4-10-84, Cl. D26-37.000.

Cederroths AB: *See*—
Adolfsson, Roger, 273,352, Cl. D6-130.000.

Charles, Derek A., to Vessa Limited. Foldable wheelchair. 273,376, 4-10-84, Cl. D12-131.000.

Clairol Incorporated: *See*—
Rogers, Meyrick K., 273,415, Cl. D23-148.000.

Clover Mfg. Co., Ltd.: *See*—
Okada, Hidekazu, 273,347, Cl. D3-28.000.

Collister, Kenneth D.; and Kheiri, Mohammad, to Miles Laboratories, Inc. Slide spinner. 273,418, 4-10-84, Cl. D24-1.100.

Conner, William A. Fan housing cover. 273,417, 4-10-84, Cl. D23-163.000.

Crockett, Arthur C., to Simmons Universal Corporation. Ottoman. 273,351, 4-10-84, Cl. D6-36.000.

D'Alo, Herbert F.; Genese, Joseph N.; and Smith, Ronald W., to Abbott Laboratories. Flow detector for an intravenous administration set. 273,419, 4-10-84, Cl. D24-8.000.

Degenshein, Edward D., to Accessories by Pearl. Belt buckle. 273,345, 4-10-84, Cl. D2-414.000.

DeLuca, Joseph C. Chip holder. 273,403, 4-10-84, Cl. D21-56.000.

Dew, Trevor J., to Dunlop Limited. Trailer. 273,374, 4-10-84, Cl. D12-102.000.

Dunlop Limited: *See*—
Dew, Trevor J., 273,374, Cl. D12-102.000.

Eilert, Randall N., to John Fluke Mfg. Co., Inc. Electronic system test instrument. 273,370, 4-10-84, Cl. D10-75.000.

Elliott, Randall L., to Vector Specialized Construction, Inc. Walk-in automatic teller building. 273,421, 4-10-84, Cl. D25-33.000.

Elliott, Randall L., to Vector Specialized Construction, Inc. Walk-in automatic teller building. 273,422, 4-10-84, Cl. D25-33.000.

Elliott, Randall L., to Vector Specialized Construction, Inc. Walk-in automatic teller building. 273,423, 4-10-84, Cl. D25-33.000.

Elliott, Randall L., to Vector Specialized Construction, Inc. Drive-up automatic teller building. 273,424, 4-10-84, Cl. D25-33.000.

Esselte Dymo N V: *See*—
Lee, James, 273,394, Cl. D18-19.000.

Evans, Roger C. Exercising device body. 273,407, 4-10-84, Cl. D21-191.000.

Fantozzi, Carlo A. Combined pour spout and drip guard. 273,369, 4-10-84, Cl. D9-436.000.

Ferretti, James A. Trim razor. 273,428, 4-10-84, Cl. D28-46.000.

Fitts Industries, Inc.: *See*—
Fitts, Lewis F., 273,354, Cl. D6-192.000.

Fitts, Lewis F., to Fitts Industries, Inc. Chair or seat end frame component. 273,354, 4-10-84, Cl. D6-192.000.

Footlick, Robert: *See*—
Levine, Allan; Pinkner, Robert; and Footlick, Robert, 273,373, Cl. D12-83.000.

Gabriel Francis Rol Inc.: *See*—
Rol, Gabriel, 273,341, Cl. D2-344.000.
Rol, Gabriel, 273,342, Cl. D2-344.000.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Cushion plug for athletic shoe collar. 273,340, 4-10-84, Cl. D2-310.000.

Genese, Joseph N.: *See*—
D'Alo, Herbert F.; Genese, Joseph N.; and Smith, Ronald W., 273,419, Cl. D24-8.000.

Gennari, Francois, to Zoldia Anstalt. Gem. 273,372, 4-10-84, Cl. D11-90.000.

Gevert, Klaus V., to Bayerische Motoren Werke Aktiengesellschaft. Combined helmet and ornamentation therefor. 273,339, 4-10-84, Cl. D2-232.000.

Gillette Company, The: *See*—
Zierhut, Clarence, 273,398, Cl. D19-57.000.
Zierhut, Clarence, 273,399, Cl. D19-57.000.
Zierhut, Clarence, 273,400, Cl. D19-57.000.
Zierhut, Clarence, 273,401, Cl. D19-57.000.

Griggs, Paul E., Jr. Pump intake manifold. 273,383, 4-10-84, Cl. D15-7.000.

Grind, Robert E. Modular picture frame. 273,355, 4-10-84, Cl. D6-235.000.

Gruber, Robert, to Surgical Appliance Industries, Inc. Knee brace. 273,420, 4-10-84, Cl. D24-64.000.

Hagedorn, Walter; and Ricci, Bernard, to Stewart Stamping Corp., a Div. of Insilco Corp. Packaging tray for wire leads. 273,363, 4-10-84, Cl. D9-341.000.

Hamada, Masanori; Ohno, Akio; Okada, Takao; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Combined portable radio and cassette tape recorder. 273,379, 4-10-84, Cl. D14-5.000.

Hayes, Thomas H., to Hoover Universal, Inc. Container handle or similar article. 273,367, 4-10-84, Cl. D9-434.000.
Hayes, Thomas H., to Hoover Universal, Inc. Container handle or similar article. 273,368, 4-10-84, Cl. D9-434.000.
Hechter, Daniel. Fountain pen. 273,396, 4-10-84, Cl. D19-49.000.
Hechter, Daniel. Fountain pen. 273,397, 4-10-84, Cl. D19-49.000.
Hestair Kiddicraft Limited: *See*—
Raffo, David M.; and Pape, John A., 273,405, Cl. D21-65.000.
Hill, Ronald J., to Hill, Ronald J. Combination knifesteel and hook design. 273,360, 4-10-84, Cl. D8-93.000.
Hirooka, Masami: *See*—
Nasu, Hitoo; Okita, Yoshishioro; Hirooka, Masami; Yanoshita, Yoshiaki; Tomiyama, Yoshio; and Murata, Kinichi, 273,384, Cl. D15-24.000.
Hitachi, Ltd.: *See*—
Abe, Takeshi; Shibayama, Masato; Asakawa, Yoshifumi; and Kinoshita, Seiji, 273,381, Cl. D14-53.000.
Hoover Universal, Inc.: *See*—
Hayes, Thomas H., 273,367, Cl. D9-434.000.
Hayes, Thomas H., 273,368, Cl. D9-434.000.
Humlong, Robert F., to Wald Manufacturing Company, Inc. Bicycle steering post. 273,375, 4-10-84, Cl. D12-118.000.
Ishii, Hisao, to Tokyo Hiyoko Co., Ltd. Packaging container. 273,362, 4-10-84, Cl. D9-317.000.
Jacobson, Jeff A. Blind cleaner. 273,432, 4-10-84, Cl. D32-52.000.
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121 4,441,940
187 4,441,941

CLASS 149

19.6 4,441,942
109.4 4,441,943

CLASS 152

417 4,441,539

CLASS 156

71 4,441,944
108 4,441,945
158 4,441,947
189 4,441,948
212 4,441,949
216 4,441,950
222 4,441,952
245 4,441,951
290 4,441,953
291 4,441,954
307.3 4,441,946
423 4,441,955
479 4,441,956
656 4,441,957

CLASS 159

2 MS 4,441,958

CLASS 160

168 R 4,441,540

CLASS 162

30.1 4,441,959
49 4,441,960
106 4,441,961
111 4,441,962

CLASS 164

453 4,441,541
485 4,441,542
491 4,441,543

CLASS 165

1 4,441,544
26 4,441,545
29 4,441,546
67 4,441,547
104.26 4,441,548
145 4,441,549
4,441,550

CLASS 166

84 4,441,551
133 4,441,552
138 4,441,553
261 4,441,554
272 4,441,555
290 4,441,556
312 4,441,557
317 4,441,558
382 4,441,559
4,441,560
387 4,441,561

CLASS 172

311 4,441,562

CLASS 173

163 4,441,563

CLASS 174

14 R 4,442,311
15 WF 4,442,312
28 4,442,313
36 4,442,314
4,442,315
84 C 4,442,316

CLASS 175

122 4,441,564
325 4,441,565
374 4,441,566

CLASS 177

25 4,441,567
129 4,441,568
211 4,441,569

CLASS 178

18 4,442,317

CLASS 179

2 A 4,442,319
2 C 4,442,318
5 R 4,442,320
18 EB 4,442,321
81 R 4,442,322
110 A 4,442,323
111 E 4,442,324
190 4,442,325

CLASS 180

9.62 4,441,570
128 4,441,571
140 4,441,572
165 4,441,573
219 4,441,574
248 4,441,575

CLASS 181

129 4,441,576
147 4,441,577
222 4,441,578
243 4,441,579
286 4,441,580
4,441,581

CLASS 182

48 4,441,582
150 4,441,583

CLASS 187

29 R 4,441,584
95 4,441,585

CLASS 188

32 4,441,586
70 R 4,441,587
73.38 4,441,588
181 T 4,441,589
195 4,441,590
202 4,441,591
264 A 4,441,592
322.11 4,441,593

CLASS 192

3.28 4,441,594
3.29 4,441,595
13 R 4,441,596
35 4,441,597
58 B 4,441,598
4,441,599
89 B 4,441,600

CLASS 193

37 4,441,601

CLASS 194

100 A 4,441,602

CLASS 198

518 4,441,603
598 4,441,604
731 4,441,605
751 4,441,606
781 4,441,607

CLASS 200

38 R 4,442,326
51 R 4,442,327
76 4,442,328
148 A 4,442,330
148 B 4,442,329

CLASS 202

172 4,441,963

CLASS 204

15 4,441,964
16 4,441,965
26 4,441,966
29 4,441,967
35 N 4,441,968
49 4,441,969
59 R 4,441,970
159.23 4,442,302
164 4,441,971
180 R 4,441,972
192 N 4,441,973
192 R 4,441,974
206 4,441,975
224 M 4,441,976
252 4,441,977
301 4,441,978
402 4,441,979
409 4,441,980
426 4,441,981
4,441,982

CLASS 206

45.14 4,441,608
204 4,441,609
361 4,441,610
431 4,441,611
511 4,441,615
620 4,441,612
621 4,441,613
624 4,441,614

CLASS 208

10 4,441,983
11 LE 4,441,984
11 R 4,441,985
4,441,986
33 4,441,987
64 4,441,988
76 4,441,989
111 4,441,990
4,441,991
251 H 4,441,992

CLASS 209

5 4,441,993
44.1 4,441,616
137 4,441,995
139 R 4,441,994

CLASS 210

241 4,441,996
256 4,442,000
266 4,441,997
275 4,441,998
354 4,441,999
402 4,442,001
411 4,442,002
445 4,442,003
448 4,442,004
613 4,442,006
614 4,442,005
631 4,442,007
683 4,442,008
697 4,442,009
729 4,442,010

CLASS 211

1.5 4,441,617
49 D 4,441,618
60 T 4,441,619

CLASS 215

232 4,441,620
247 4,441,621

CLASS 217

99 4,441,622

CLASS 219

10.43 4,442,331
10.67 4,442,332
69 W 4,442,333
73 4,442,334
79 4,442,335
98 4,442,336
117.1 4,442,337
121 PE 4,442,338
130.33 4,442,339
137 PS 4,442,340
201 4,442,341
216 4,442,342
433 4,442,343
497 4,442,344

CLASS 220

90.4 4,441,623
254 4,441,624
257 4,441,625
443 4,441,626
461 4,441,627

CLASS 221

90 4,441,628
297 4,441,630

CLASS 222

86 4,441,631
129 4,441,632
153 4,441,633
324 4,441,629
402.16 4,441,634
402.22 4,441,635
541 4,441,636
556 4,441,637

CLASS 224

35 4,441,638
237 4,441,639
252 4,441,640
311 4,441,641

CLASS 225

46 4,441,642

CLASS 227

110 4,441,643
130 4,441,644

CLASS 228

47 4,441,645
116 4,441,646
119 4,441,647

CLASS 229

37 R 4,441,648
38 4,441,649
39 B 4,441,650

CLASS 235

379 4,442,346
380 4,442,345
474 4,442,347

CLASS 236

49 4,441,651
56 4,441,652
93 R 4,441,653

CLASS 239

89 4,441,654
163 4,441,655
708 4,441,656

CLASS 241

14 4,441,657
46.17 4,441,658
70 4,441,659

CLASS 242

35.5 A 4,441,660
55 4,441,661
58 4,441,662
65 4,441,663
75.42 4,441,664
129 4,441,665
134 4,441,666
197 4,441,667

CLASS 244

3.11 4,441,668
3.13 4,441,669
3.22 4,441,670
63 4,441,671
110 C 4,441,672
135 R 4,441,673
137 R 4,441,674
213 4,441,675
234 4,441,676

CLASS 248

74 B 4,441,677
146 4,441,678
156 4,441,679
220.4 4,441,680
475 R 4,441,682
475.1 4,441,681
558 4,441,683
674 4,441,684

CLASS 249

51 4,441,685

CLASS 250

203 R 4,442,348
222.1 4,442,349
227 4,442,350
237 G 4,442,351
251 4,442,352
281 4,442,353
4,442,354
310 4,442,355
324 4,442,356
338 4,442,357
342 4,442,359
435 4,442,358
486.1 4,442,360
491.1 4,442,361

CLASS 251

127 4,441,686
139 4,441,687
327 4,441,688
366 4,441,689

CLASS 252

8.5 M 4,442,011
8.55 C 4,442,014
8.6 4,442,012
8.8 4,442,013
68 4,442,015
70 4,442,016
301.21 4,442,017
307 4,442,018
309 4,442,019
373 4,442,020
389 R 4,442,021
522 R 4,442,025
574 4,442,027
628 4,442,028

CLASS 254

279 4,441,690
344 4,441,691
390 4,441,692
420 4,441,693

CLASS 260

112.5 R 4,442,029
4,442,030
4,442,031
149 4,442,032
158 4,442,033
236.6 4,442,034
239.55 R 4,442,035
396 R 4,442,036
397.2 4,442,037
429 R 4,442,040
455 R 4,442,038
465.4 4,442,039
502.5 F 4,442,041
512 R 4,442,042
513 R 4,442,043
969 4,442,044

CLASS 261

36 R 4,442,045
44 B 4,442,046
66 4,442,047
114 R 4,442,048
148 4,442,049

CLASS 264

4.3 4,442,051
30 4,442,050
4,442,052
36 4,442,053
40.1 4,442,054
105 4,442,055
161 4,442,056
163 4,441,694
176 F 4,442,057
176 R 4,442,058
228 4,442,059
328.2 4,442,060
328.7 4,442,061
518 4,442,062
532 4,442,063
551 4,442,064

CLASS 266

57 4,441,695
4,441,696
170 4,441,697
249 4,441,698
255 4,441,699
281 4,441,700
287 4,441,701

CLASS 271

177 4,441,702
243 4,441,703
303 4,441,704

CLASS 272

73 4,441,705
118 4,441,706
119 4,441,707
130 4,441,708

CLASS 273

1.5 R 4,441,709
54 B 4,441,711
54 R 4,441,710
73 D 4,441,712
73 J 4,441,713
144 B 4,441,714
153 S 4,441,715
183 C 4,441,716
201 4,441,717
254 4,441,718
402 4,441,719

CLASS 277

3 4,441,720
26 4,441,721
134 4,441,722
164 4,441,723
166 4,441,724
167.5 4,441,725
230 4,441,726

CLASS 280

62 4,441,727
213 4,441,728
278 4,441,729
426 4,441,730
495 4,441,731
614 4,441,732
633 4,441,733
638 4,441,734
754 4,441,736
771 4,441,735
804 4,441,737
806 4,441,738

CLASS 281

16 4,441,739

CLASS 285

18 4,441,740
4,441,741
4,441,742
21 4,441,743
162 4,441,744
417 4,441,745

CLASS 292

336.3 4,441,236

CLASS 294

19 R 4,441,746
51 4,441,747
74 4,441,748
83 R 4,441,750
88 4,441,749

CLASS 296

1 S 4,441,751
4,441,752
4,441,753
51 4,441,754
93 4,441,755

CLASS 297

39 4,441,756
55 4,441,757
439 4,441,758

CLASS 299

2 4,441,759
4,441,760
64 4,441,761

CLASS 301

37 R 4,441,762

CLASS 303

23 R 4,441,763
40 4,441,764

CLASS 307

108 4,442,362
141.4 4,442,363
147 4,442,364
279 4,442,365
597 Re.31,551

CLASS 308

6 C 4,441,765

CLASS 310

50 4,442,366
91 4,442,367
201 4,442,368
214 4,442,369
239 4,442,370
260 4,442,371
339 4,442,372

CLASS 312

214 4,441,766
216 4,441,767
257 SM 4,441,768
270 4,441,769
276 4,441,770
322 4,441,771
330 R 4,441,772
4,441,773

CLASS 313

35 4,442,373
142 4,442,375
316 4,442,374
402 4,442,376
503 4,442,377

CLASS 315

13 C Re.31,552
47 4,442,378
4,442,379
101 4,442,380
151 4,442,381
241 P 4,441,774
287 4,442,382
349 4,442,383
399 4,442,384

CLASS 318

140 4,442,385
254 4,442,386
568 4,442,387
640 4,442,388
642 4,442,389
663 4,442,390
4,442,391
696 4,442,392
802 4,442,393
807 4,442,394

CLASS 320

48 4,442,395

CLASS 322

21 4,442,396

CLASS 323

275 4,442,397
315 4,442,398
4,442,399
4,442,400
351 4,442,401

CLASS 324

158 D 4,442,402
220 4,442,403
309 4,442,404
439 4,442,405

CLASS 328

134 4,442,406

CLASS 330

128 4,442,407
261 4,442,408
274 4,442,409
289 4,442,410
296 4,442,411

CLASS 331

1 4,442,412
1 A 4,442,413

CLASS 332

7.51 4,442,414
16 T 4,442,415

CLASS 333

263 4,442,416

CLASS 335

210 4,442,417
230 4,442,418

CLASS 336

100 4,442,419

CLASS 338

34 4,442,420
35 4,442,421
4,442,422

CLASS 339

89 R 4,441,775
91 R 4,441,776
94 M 4,441,777
99 R 4,441,778
4,441,779
143 R 4,441,780
177 R 4,441,781
199 R 4,441,782

CLASS 340

52 F 4,442,424
347 P 4,442,423
365 S 4,442,425
539 4,442,426
546 4,442,427
703 4,442,428
786 4,442,429

CLASS 343

6.5 R 4,442,430

7 ED 4,442,431
378 4,442,433
394 4,442,432
701 4,442,434
709 4,442,435
722 4,442,436
786 4,442,437
792 4,442,438

CLASS 346

1.1 4,442,439
4,442,440
74.4 4,442,441
136 4,442,442
140 R 4,442,443
208 4,442,176

CLASS 350

96.10 4,441,783
96.15 4,441,784
96.20 4,441,785
96.21 4,441,786
96.23 4,441,787
96.34 4,441,788
166 4,441,789
302 4,441,790
360 4,441,791
415 4,441,792
536 4,441,793
580 4,441,794

CLASS 351

169 4,441,795

CLASS 352

184 4,441,796

CLASS 354

145.1 4,441,799
152 4,441,800
173.11 4,441,801
224 4,441,802
299 4,441,803
416 4,441,797
483 4,441,798

CLASS 355

14 R 4,441,804
4,441,805
23 4,441,806
40 4,441,807
53 4,441,808

CLASS 356

1 4,441,809
4,441,810
128 4,441,811
147 4,441,812
237 4,441,813
305 4,441,814
328 4,441,815
335 4,441,816
372 4,441,818
375 4,441,817
380 4,441,819

CLASS 357

13 4,442,444
22 4,442,445
30 4,442,446
41 4,442,447
42 4,442,448
67 4,442,449
81 4,442,450

CLASS 358

73 4,442,451
75 4,442,452
109 4,442,453
167 4,442,454
209 4,442,455
213 4,442,456
4,442,457
243 4,442,458
286 4,442,459
296 4,442,460
343 4,442,461

CLASS 360

33.1 4,442,462
60 4,442,463
72.1 4,442,464
75 4,442,466
105 4,442,467
128 4,442,468
130.23 4,442,465

CLASS 361

4 4,442,469
46 4,442,470
63 4,442,471
96 4,442,472
275 4,442,473
283 4,442,474
383 4,442,475
395 4,442,476

CLASS 362

52 4,442,477
191 4,442,478

CLASS 363

57 4,442,480
60 4,442,481
61 4,442,482
131 4,442,483
136 4,442,479

CLASS 364

200 4,442,484
4,442,485
4,442,486
4,442,487
4,442,488
414 4,442,489
433 4,442,490
454 4,442,491
464 4,442,492
475 4,442,493
511 4,442,494
521 4,442,495
524 4,442,496
561 4,442,497
574 4,442,499
724 4,442,500
745 4,442,498
900 4,442,501
4,442,502
4,442,503
4,442,504
4,442,505
4,442,506

CLASS 365

100 4,442,507
104 4,442,508
154 4,442,509
218 4,442,510

CLASS 366

26 4,441,820
61 4,441,821
101 4,441,822
167 4,441,823
266 4,441,824

CLASS 367

78 4,442,511
87 4,442,512
100 4,442,513
136 4,442,514
197 4,442,515

CLASS 368

204 4,441,825
4,441,826

CLASS 369

43 4,442,516
71 4,442,517

CLASS 371

8 4,442,518
27 4,442,519
55 4,442,520
68 4,442,521

CLASS 372

2 4,442,522
56 4,442,523
107 4,442,524

CLASS 373

93 4,442,525
95 4,442,526

CLASS 374

153 4,441,827

CLASS 375

1 4,442,527
20 4,442,528
34 4,442,529
67 4,442,530
94 4,442,531

CLASS 376

280 4,442,065
302 4,442,066

CLASS 377

3 4,442,532

CLASS 378

21 4,442,533
4,442,534
26 4,442,536
50 4,442,535
99 4,442,537
146 4,442,538
207 4,442,539

CLASS 381

31 4,442,540

CLASS 382

7 4,442,541
8 4,442,542
49 4,442,543
53 4,442,544
56 4,442,545

CLASS 400

63 4,441,829
124 4,441,828
4,441,830
134.3 4,441,831
144.2 4,441,832
180 4,441,833

CLASS 402

55 4,441,834

CLASS 403

24 4,441,835
154 4,441,836
300 4,441,837

CLASS 405

150 4,441,838
202 4,441,839
267 4,441,840

CLASS 407

114 4,441,841

CLASS 410

81 4,441,842

CLASS 411

349 4,441,843

CLASS 414

24.6 4,441,845
31 4,441,847
117 4,441,844
335 4,441,846
439 4,441,848
490 4,441,849
545 4,441,850
563 4,441,851
733 4,441,852
757 4,441,853
787 4,441,854

CLASS 415

53 T 4,441,855
155 4,441,856
213 R 4,441,857

CLASS 416

17 4,441,858
96 A 4,441,859

CLASS 417

40 4,441,860
54 4,441,861
250 4,441,862
281 4,441,863
282 4,441,872
319 4,441,864
4,441,865
364 4,441,866
475 4,441,867
490 4,441,868

CLASS 418

51 4,441,869
55 4,441,870
97 4,441,871

CLASS 420

428 4,442,067
584 4,442,068

CLASS 422

62 4,442,069
133 4,442,070

CLASS 423

10 4,442,071
22 4,442,072
54 4,442,073
4,442,074
76 4,442,075
78 4,442,076
210 4,442,077
230 4,442,078
239 4,442,079
4,442,080
321 R 4,442,081
350 4,442,082
567 R 4,442,083

CLASS 424

49 4,442,085
79 4,442,086
85 4,442,087
4,442,088
177 4,442,089
178 4,442,090
181 4,442,091
195 4,442,092
236 4,442,093
246 4,442,094
248.5 4,442,095
4,442,096
4,442,097
248.51 4,442,098
248.57 4,442,099
250 4,442,100
4,442,101
4,442,102
4,442,103
251 4,442,084
258 4,442,106
4,442,107
4,442,108
4,442,109
263 4,442,110
4,442,111
4,442,112
267 4,442,113
4,442,114
4,442,115
269 4,442,116
270 4,442,117
273 R 4,442,118
274 4,442,119
4,442,120
282 4,442,121
4,442,122
304 4,442,123
308 4,442,124
311 4,442,125
318 4,442,126
324 4,442,127
331

CLASS 425

3 4,441,875
64 4,441,873
78 4,441,874
174.8 E 4,441,876
338 4,441,877
534 4,441,878

CLASS 426

41 4,442,128
250 4,442,104
4,442,105
399 4,442,129
462 4,442,130
518 4,442,131
549 4,442,132

CLASS 427

2 4,442,133
9 4,442,134
31 4,442,135
53.1 4,442,136
57 4,442,137
116 4,442,138
122 4,442,139
154 4,442,140
164 4,442,141
316 4,442,142
340 4,442,143
355 4,442,144
385.5 4,442,145
386 4,442,146

CLASS 428

35 4,442,147
40 4,442,148
53 4,442,149
4,442,150
54 4,442,151
77 4,442,152
99 4,442,153
4,442,154
4,442,155
142 4,442,156
173 4,442,157
195 4,442,158
212 4,442,159
215 4,442,160
219 4,442,161
220 4,442,179
245 4,442,162
262 4,442,163
283 4,442,164
307.7 4,442,165
323 4,442,166
4,442,167
331 4,442,168
332 4,442,169
333 4,442,170
336 4,442,171
342 4,442,172
372 4,442,173
376 4,442,174
404 4,442,175
412 4,442,177
446 4,442,178
551 4,442,180
623 4,442,181
654 4,442,182

CLASS 429

29 4,442,183
54 4,442,184
111 4,442,185
142 4,442,186
213 4,442,187

CLASS 430

5 4,442,188
45 4,442,189
53 4,442,190
55 4,442,191
59 4,442,192
83 4,442,193
137 4,442,194
191 4,442,195
195 4,442,196
280 4,442,197
311 4,442,198
323 4,442,199
538 4,442,200
569 4,442,201
600 4,442,202

CLASS 431

284 4,441,879

CLASS 432

13 4,441,880

CLASS 433

001 4,441,235

CLASS 435

6 4,442,203
7 4,442,204
68 4,442,205
4,442,206
105 4,442,207
116 4,442,208
119 4,442,209
161 4,442,210
168 4,442,211
188 4,442,212
217 4,442,213
253 4,442,214
262 4,442,215
288 4,442,216

CLASS 436

161 4,442,217
525 4,442,218

CLASS 455

72 4,442,546
180 4,442,547
195 4,442,548
211 4,442,549
608 4,442,550

CLASS 501

95 4,442,219
139 4,442,220

CLASS 502

25 4,442,221
60 4,442,222
68 4,442,223
112 4,442,224
4,442,225
150 4,442,022
209 4,442,226
222 4,442,023
243 4,442,227
334 4,442,024

CLASS 518

714 4,442,228

CLASS 521

26 4,442,229
28 4,442,230
32 4,442,231
56 4,442,232
98 4,442,233
112 4,442,234
122 4,442,235
130 4,442,236
131 4,442,237
164 4,442,238

CLASS 523

116 4,442,239
4,442,240
130 4,442,241
200 4,442,242
212 4,442,243
221 4,442,244
401 4,442,245
404 4,442,246
414 4,442,247
4,442,248
455 4,442,249

CLASS 524

98 4,442,250
141 4,442,251
183 4,442,252
211 4,442,253
413 4,442,254
414 4,442,255
539 4,442,256
555 4,442,257
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